

UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION

ACORN SEMI, LLC,

Plaintiff,

VS.

SAMSUNG ELECTRONICS CO., LTD.,  
SAMSUNG ELECTRONICS AMERICA,  
INC., SAMSUNG SEMICONDUCTOR,  
INC., and SAMSUNG AUSTIN  
SEMICONDUCTOR, LLC,

Defendants.

CASE NO.  
2:19-cv-000347-JRG

REPORTER'S RECORD

TRANSCRIPT OF JURY TRIAL (VOLUME 1)

BEFORE THE HONORABLE JAMES RODNEY GILSTRAP

May 13, 2021; 8:44 a.m.

MARSHALL, TEXAS

Proceedings recorded in realtime via machine shorthand.

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## I N D E X

(JURY TRIAL - VOLUME 1)

May 13, 2021

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1                                   \*\*\*\*\* PROCEEDINGS \*\*\*\*\*

2                   THE COURT: All right. Counsel, are the  
3 parties prepared to present their opening statements  
4 after Court gives its preliminary instructions?

08:44AM 5                   MR. HUESTON: Yes, your Honor. John Hueston on  
6 behalf of Plaintiff.

7                   THE COURT: Defendants.

8                   MR. McKEON: On behalf of Samsung, we are, your  
9 Honor. We're ready to proceed.

08:44AM 10                  THE COURT: Please proceed.

11                               (Whereupon, jurors enter the courtroom.)

12                                       PRELIMINARY INSTRUCTIONS

13                  THE COURT: Good morning, ladies and gentlemen.  
14 Welcome back. Please have a seat.

08:45AM 15                  Thank you, ladies and gentlemen, for being here  
16 promptly. I had some matters I had to take up of  
17 counsel. We're getting a little bit of late start, but  
18 at this point, I have some preliminary instructions I  
19 need to give you, and I need to give these to you on the  
08:45AM 20 record before the lawyers proceed to present their  
21 opening statements.

22                               You've now been sworn as the jury in this case,  
23 and as the jury, you are the sole judges of the facts,  
24 and it is you that will decide what all the facts are in  
08:45AM 25 this case. As the judge, I'll give you instructions on



1 the law. I'll decide questions of law, evidence, or  
2 procedures that arise during the trial. I'm responsible  
3 for maintaining an efficient flow of the evidence  
4 throughout the trial process and for maintaining the  
5 proper decorum of the courtroom.

6 At the end of the evidence, I'll give you  
7 detailed instructions about the law to apply in deciding  
8 this case, and I'll give you a list of questions that  
9 you are then to answer. This list of questions, ladies  
10 and gentlemen, is called the verdict form, and your  
11 answers to those questions will need to be unanimous.  
12 Those unanimous answers to those questions will  
13 constitute the jury's verdict in this case.

14 Now, I want to briefly tell you what this case  
15 is about. This case involves a dispute regarding four  
16 certain United States patents. Now, I know that each of  
17 you saw the patent video film prepared by the Federal  
18 Judicial Center as a part of the jury selection, but I  
19 need to give you some instructions now, and on the  
20 record, about a patent and how one is obtained.

21 Patents are granted or denied by the  
22 United States Patent and Trademark Office, an agency of  
23 the United States government, which is sometimes called,  
24 and you'll hear it referred to throughout the trial,  
25 either as the "patent office" or the "PTO." A valid

1 United States Patent gives the holder of the patent the  
2 right for up to 20 years from the date the patent  
3 application is filed to prevent others from making,  
4 using, offering to sell or selling the patented  
5 invention within the United States or from importing it  
6 into the United States without the patent holder's  
7 permission.

8 A patent is a form of property called  
9 intellectual property, and like other forms of property,  
10 a patent can be bought or sold. A violation of the  
11 patent holder's rights is called infringement. A patent  
12 holder may try to enforce a patent against persons it  
13 believes to be infringers by filing a lawsuit in a  
14 United States district court, and that's what we have  
15 before us in this case.

16 The process of obtaining a patent is called  
17 patent prosecution. To obtain a patent, one must first  
18 file an application with the United States Patent and  
19 Trademark Office, the PT0. As I mentioned, the PT0 is  
20 an agency of the United States government, and it  
21 employs trained examiners who review applications for  
22 patents. The application includes within it something  
23 called a specification. The specification contains a  
24 written description of the claimed invention, telling  
25 what the invention is, how it works, how to make it, and

1 how to use it. The specification concludes or ends with  
2 one or more numbered sentences. These numbered  
3 sentences are the patent claims.

08:48AM 4 When a patent is granted by the PT0, it is the  
5 claims, ladies and gentlemen, that define the boundaries  
6 of its protection and give notice to the public of those  
7 boundaries. Patent claims may exist in two forms  
8 referred to as independent claims and dependent claims.

08:49AM 9 An independent claim in a patent does not refer  
10 to any other claim; it's independent. It's not  
11 necessary to look at any other claim within a patent to  
12 determine what an independent patent claim covers.

13 However, a dependent claim refers to at least one other  
14 claim in the patent. A dependent claim includes each of  
08:49AM 15 the elements or limitations of that other claim or  
16 claims to which it refers, or as we sometimes say, from  
17 which it depends, as well as the additional elements or  
18 limitations recited within the dependent claim itself.

19 Accordingly, to determine what a dependent  
08:49AM 20 claim covers, it's necessary to look at both the  
21 dependent claim itself and the independent claim or  
22 claims to which it refers or, as we say, from which it  
23 depends.

24 The claims of the patents ensued in this case  
08:49AM 25 use the word "comprising." "Comprising" means including

1 or containing. A claim that includes the word  
2 "comprising" is not limited to the methods or devices  
3 having only the elements that are recited in the claim  
4 but also covers methods or devices that add additional  
5 elements.

08:50AM

6 Let me give you a simple example. If you  
7 consider a claim that covers a table, if the claim  
8 recites a table comprising a tabletop, legs, and glue,  
9 then the claim will cover any table that contains these  
10 structures, even if the table also contains other  
11 structures, such as a leaf to expand the size of the  
12 tabletop or wheels to go on the ends of the legs.

08:50AM

13 Now, that's a very simple example using the  
14 word "comprising" and what it means. In other words,  
15 ladies and gentlemen, it can have other features in  
16 addition to those covered by the patent.

08:50AM

17 Now, after an applicant files his or her  
18 application with the PT0, an examiner is assigned who  
19 reviews the application to determine whether or not the  
20 claims are patentable; that is to say, appropriate for  
21 patent protection, and whether or not the specification  
22 adequately describes the invention that's claimed.

08:51AM

23 In examining a patent application, the examiner  
24 reviews certain information about the state of the  
25 technology at the time the application was filed. The

08:51AM

1 PT0 searches for and reviews this type of information  
2 that is publicly available or that was submitted by the  
3 applicant. This type of information is called, "prior  
4 art."

08:51AM

5 The examiner reviews this prior art to  
6 determine whether or not the invention claimed is truly  
7 an advance over the state of the art at the time. Prior  
8 art is defined by -- and I'll give you specific  
9 instructions later as to what constitutes prior art;

08:52AM

10 however, in general, prior art includes information that  
11 demonstrates the state of the technology that existed  
12 before the claimed invention was made or before the  
13 application for the patent was filed.

08:52AM

14 A patent also contains a certain list of prior  
15 art that the examiner has considered. The items on this  
16 list are called the cited references. Now, after the  
17 prior art search and examination of the application, the  
18 examiner informs the applicant in writing of what the  
19 examiner has found and whether the examiner considers  
20 any claim to be patentable, in which case it would be  
21 allowed.

08:52AM

22 Now, this writing from the examiner to the  
23 applicant is called an office action. Now, if the  
24 examiner rejects the claims, the applicant has an  
25 opportunity to respond to the examiner, to try to

08:52AM

1 persuade the examiner to allow the claims. The  
2 applicant also has the opportunity to change or amend  
3 the claims or to submit new claims, and the papers  
4 generated during these communications back and forth  
5 between the examiner and the applicant are called the  
6 prosecution history.

7 This process may go back and forth between the  
8 examiner and the applicant for some time until the  
9 examiner is ultimately satisfied that the application  
10 meets the requirements for a patent, and in that case,  
11 the application issues as a United States Patent.

12 Or in the alternative, if the examiner  
13 ultimately concludes that the application should be  
14 rejected, then no patent is issued. Sometimes patents  
15 are issued after appeals within the PTO or to a court.

16 Now, to help you follow the evidence in this  
17 case, I want to give you a brief summary of the  
18 positions of the two parties. As you know, the party  
19 who brings a lawsuit is called the Plaintiff. The  
20 Plaintiff in this case is Acorn Semi, LLC, which you are  
21 going to hear referred to throughout the trial simply  
22 either as "the Plaintiff" or as "Acorn."

23 And, as you know, the party or parties against  
24 whom a lawsuit is brought are called "the Defendants,"  
25 and in this case, the Defendants are Samsung Electronics

1 Company Limited; Samsung Electronics America, Inc.;  
2 Samsung Semiconductor, Inc.; and Samsung Austin  
3 Semiconductor, LLC, which, you are going to hear these  
4 four entities referred to collectively throughout the  
08:54AM 5 trial as either "the Defendants" or simply as "Samsung."

6 Now, as I told you during jury selection, this  
7 is a case of alleged patent infringement. And as I may  
8 have already mentioned, there are four separate  
9 United States patents that have been asserted in this  
08:54AM 10 case.

11 The first of these patents is United States  
12 Patent Number 8,766,336. And as you have heard, patents  
13 are commonly referred to by their last three digits. So  
14 in this case, Patent Number 8,766,336 is going to be  
08:55AM 15 referred to, and you'll hear it referred to throughout  
16 the trial simply as the "'336 Patent" or the "'336  
17 Patent."

18 The second U.S. patent at issue in this case is  
19 United States Patent Number 9,461,167, which you'll hear  
08:55AM 20 referred to as the "'167 Patent" or the "'167 Patent."

21 The third United States Patent at issue is  
22 United States Patent 9,905,691, which you'll hear  
23 called the "'691 Patent" or the "'691 Patent."

24 And the fourth and final United States Patent  
08:55AM 25 at issue in this case is United States Patent Number

1 1,090,395, which you'll hear referred to throughout the  
2 trial as the "'395 Patent" or the "'395 Patent."

3 Now, these four patents, ladies and gentlemen,  
4 are going to be collectively referred to, at various  
08:56AM 5 times throughout the trial, as the patents in suit. You  
6 may also hear them referred to collectively throughout  
7 the trial as the asserted patents. These patents  
8 generally relate to semiconductors and their  
9 manufacturer.

08:56AM 10 The Plaintiff in this case, Acorn, contends  
11 that the Samsung defendants are infringing certain  
12 claims of these four patents-in-suit by making, selling,  
13 or offering for sale in the United States or importing  
14 into the United States products that include its  
08:56AM 15 patented technology.

16 Acorn contends that it's entitled to money  
17 damages as a result of that infringement. Acorn also  
18 contends that Samsung has willfully infringed the  
19 asserted patents.

08:57AM 20 Samsung denies that it infringes any of the  
21 claims of Acorn's asserted patents, and Samsung denies  
22 that any infringement has been willful. Samsung also  
23 contends that Acorn is not entitled to any money  
24 damages.

08:57AM 25 Now, I want you to know, and I'm aware, that



1 there are many new words and concepts that have been  
2 thrown at you. I'm going to define a lot of these words  
3 and explain these concepts to you as we go through these  
4 instructions. The attorneys are going to discuss them  
5 during their opening statements. The witnesses, over  
6 the course of the trial, are going to help you  
7 understand this through their testimony.

8 So, ladies and gentlemen, please do not feel  
9 overwhelmed at this stage. I promise you, it will all  
10 come together as we go forward. Now, one of your jobs  
11 in this case is to decide whether or not the asserted  
12 claims of the four asserted patents have been infringed.  
13 If you decide that any claim of the patents-in-suit has  
14 been infringed by the Defendants, then you'll need to  
15 decide whether or not that infringement has been  
16 willful.

17 You will then also need to decide what amount  
18 of money damages should be awarded to the Plaintiff as  
19 compensation for that infringement.

20 Now, as I mentioned, my job in this case is to  
21 tell you what the law is, to handle rulings on evidence  
22 and procedure, and to oversee the conduct of the trial  
23 and to maintain a proper decorum in the courtroom. In  
24 determining the law, it's specifically my job to  
25 determine the meanings of any of the claim language from

1 the claims that have been asserted that needs to be  
2 interpreted. I've already determined the meanings of  
3 this claim language for the patents-in-suit, and you  
4 must accept the meanings or definitions, sometimes  
5 called constructions, that I am going to give you, and  
6 you must apply those meanings to the particular claims  
7 throughout the course of the trial.

8           You are going to be given a document in a few  
9 minutes that reflects those meanings that the Court is  
10 providing to you. For any claim language for which I  
11 have not provided you with a meaning or a definition,  
12 you should apply the plain and ordinary meaning of that  
13 language, as understood by a person of ordinary skill in  
14 the art.

15           If, however, I have provided you with a  
16 specific meaning, definition, or, as I say, they are  
17 sometimes called constructions, then you are to apply my  
18 definition or construction of that language to those  
19 terms throughout the case. However, ladies and  
20 gentlemen, my interpretation of any language from the  
21 asserted claims should not be taken by you as an  
22 indication that I have a personal opinion or any opinion  
23 at all regarding the issue of infringement, because the  
24 issue of infringement is for the jury to decide and only  
25 for the jury to decide in the course of this trial.

1 I'm going to provide you with more detailed  
2 instructions on the meaning of the claims before you  
3 retire to deliberate on your verdict. In deciding the  
4 issues that are before you, you will also be -- you will  
09:00AM 5 also be asked to consider specific legal rules, and I'm  
6 going to give you an overview of those rules now. And  
7 at the conclusion of the case, I'll give you more  
8 detailed instructions.

9 First, I'll remind you that the burden of proof  
09:00AM 10 in this case is what is known as the preponderance of  
11 the evidence. This burden of proof may sometimes be  
12 talked about and called out to be the greater weight and  
13 degree of credible testimony. The burden of proof,  
14 known as the preponderance of the evidence, means that  
09:00AM 15 the jury must be persuaded by the credible and  
16 believable evidence that the claim asserted is more  
17 probably true than not true, more probably true than not  
18 true.

19 Let me remind you of the example I gave you  
09:01AM 20 during jury selection. If you look at the statue in the  
21 courtroom in front of the court reporter, the Lady of  
22 Justice, she holds in her left hand, raised above her,  
23 the scales of justice. Those scales start off at the  
24 beginning of this trial, where we are now, exactly  
09:01AM 25 balanced and equal.

1 Over the course of the trial, the Plaintiff  
2 will put on their testimony. Consider that the  
3 Plaintiff's testimony goes on one side of those scales,  
4 and the Defendant will put its testimony in evidence on  
5 the other scale, the other side of the scales; and when  
6 all the evidence has been produced and presented during  
7 this trial, if the party has the burden of proof by a  
8 preponderance of the evidence and you consider those  
9 scales, if those scales tip in favor of the party who  
10 has that burden of proof by a preponderance of the  
11 evidence, even if they tip ever so slightly, then that  
12 party has met its burden of proof by a preponderance of  
13 the evidence; again, the greater weight and degree of  
14 credible testimony, more probably true than not true.

15 Now, at the time the jury was selected in this  
16 case, back on April the 30th, I talked to you about  
17 another burden of proof called clear and convincing  
18 evidence. Since that time, it's become clear to the  
19 Court that in this particular case, that burden of proof  
20 is not going to be applied, and you will not be called  
21 upon to apply a second burden of proof called clear and  
22 convincing evidence.

23 The burden of proof that you are going to apply  
24 to all the evidence in this case is the preponderance of  
25 the evidence standard. Also, ladies and gentlemen, I

1 want to remind you that at no time in this trial will  
2 you ever apply a third and different burden of proof  
3 called beyond a reasonable doubt. That's the burden of  
4 proof that applies in a criminal case, and it has  
09:03AM 5 absolutely no application in a civil case like this.

6 Now, the first issue that you are going to be  
7 asked to decide is whether or not the Samsung defendants  
8 have infringed any of the asserted claims of the  
9 patents-in-suit. Let me remind you: Infringement is  
09:03AM 10 determined and assessed on a claim-by-claim basis, and  
11 Acorn, the Plaintiff, must show you by a preponderance  
12 of the evidence that a claim has been infringed.

13 Accordingly, there can be infringement of one  
14 claim within a patent but no infringement as to another  
09:03AM 15 claim within the patent. In general, a defendant may  
16 infringe the asserted patent by making, using, selling,  
17 or offering for sale in the United States or importing  
18 into the United States a product meeting all of the  
19 requirements of a claim of an asserted patent or a  
09:04AM 20 method that practices all required steps of a claim  
21 without the permission of the patent holder.

22 I'll provide you with more detailed  
23 instructions about the requirements for infringement at  
24 the end of the case.

09:04AM 25 Now, if you decide that any claim of the

1 patents-in-suit has been infringed, you'll then need to  
2 decide whether that infringement has been willful. The  
3 Plaintiff has the burden of proof to prove willful  
4 infringement by a preponderance of the evidence.

09:04AM

5 Further, if you decide that any of the asserted  
6 claims of the patents-in-suit has been infringed, then  
7 you will also need to decide what amount of money  
8 damages should be awarded to the Plaintiff in this case,  
9 Acorn, to compensate it for that infringement

09:04AM

10 A damages award, ladies and gentlemen,  
11 must be adequate to compensate the patent holder for the  
12 infringement, but in -- and in no event may a damage  
13 award be less than what the patent holder would have  
14 received if it had been paid a reasonable royalty for  
15 the use of its patent.

09:05AM

16 However, any damages that you award are meant  
17 to compensate the patent holder and they are not meant  
18 to punish the Defendant. And you may not include in the  
19 damages award any additional amount as a fine or a  
20 penalty above what is necessary to fully compensate the  
21 patent holder for any infringement that you have found.

09:05AM

22 Moreover, damages in a case like this cannot be  
23 speculative, and the Plaintiff, Acorn, must prove the  
24 amount of its damages for the alleged infringement by a  
25 preponderance of the evidence.

09:05AM

1 I'll give you more detailed instructions on the  
2 calculation of damages for the alleged infringement of  
3 the patents-in-suit at the conclusion of the trial,  
4 including by giving you specific instructions with  
09:05AM 5 regard to the calculation of a reasonable royalty.  
6 However, let me remind you, the fact that I am  
7 instructing you on damages now does not mean that Acorn  
8 is or is not entitled to recover damages.

9 Now, ladies and gentlemen, over the course of  
09:06AM 10 the trial, you are going to be hearing from a number of  
11 witnesses in this case, and I want you to keep an open  
12 mind while you are listening to the evidence and not  
13 decide any of the facts until you've heard all the  
14 evidence. This is important.

09:06AM 15 While the witnesses are testifying, remember  
16 that you, the jury, will have to decide and determine  
17 the degree of credibility and believability to allocate  
18 to each of the witnesses and all of the evidence that's  
19 presented over the course of the trial.

09:06AM 20 So while the witnesses are testifying, you  
21 should be asking yourselves things like this: Does the  
22 witness impress you as being truthful? Did he or she  
23 have a reason not to tell the truth? Does he or she  
24 have any personal interest in the outcome of the case?  
09:07AM 25 Does the witness seem to have a good memory? Did he or

1 she have the opportunity and ability to observe  
2 accurately the things that they testified about? Did  
3 the witness appear to understand the questions clearly  
4 and answer them directly? And, of course, does the  
09:07AM 5 witness's testimony differ from the testimony of any  
6 other witness; and if it does differ, how does it  
7 differ?

8           These are some of the kinds of things you  
9 should be thinking about while you are listening to each  
09:07AM 10 witness that will testify over the course of this trial.

11           Also, I want to talk to you briefly about  
12 expert witnesses. When knowledge of a technical subject  
13 may be helpful to the jury, a person who has special  
14 training or experience in that particular technical  
09:07AM 15 field -- we call them an expert witness -- is permitted  
16 to testify to the jury about his or her opinions on  
17 those technical matters. However, ladies and gentlemen,  
18 you are not required to accept an expert witness's, or  
19 any witness's, opinions at all. It's up to you to  
09:08AM 20 decide whether you believe an expert witness or any  
21 witness and whether you believe what they tell you is  
22 correct or incorrect, or whether you want to give it any  
23 weight at all or a considerable amount of weight. Those  
24 decisions are yours and yours alone.

09:08AM 25           Now, I anticipate that there will be expert



1 witnesses testifying in support of each side in this  
2 case, but it will be up to you to listen to their  
3 qualifications when they testify; and when they offer  
4 you an opinion and explain the basis for that opinion,  
09:08AM 5 you will have to evaluate what they say and whether you  
6 believe it or not and to what degree, if any, that you  
7 want to give that opinion weight.

8 Remember, ladies and gentlemen, judging and  
9 evaluating the credibility and the believability of each  
09:08AM 10 and every witness is an important part of your job as  
11 jurors.

12 Now, during the trial, it's possible that some  
13 testimony from one or more witnesses is going to be  
14 presented to you through what we call a deposition. In  
09:09AM 15 trials like this, it's very difficult, if not impossible  
16 sometimes, to get every witness in the same place at the  
17 same time to offer their testimony live and in person  
18 from the witness stand.

19 So before the trials begin, the lawyers for  
09:09AM 20 each side take the depositions of all the witnesses. In  
21 a deposition, a court reporter is present, the witness  
22 is sworn and placed under oath, and then they are asked  
23 questions by both sides in the case, through their  
24 lawyers, and the questions and the witnesses' answers  
09:09AM 25 are taken down and recorded; and in most cases, those

1 depositions are video-recorded.

2 Now, it's important for you to understand,  
3 ladies and gentlemen, that over the course of the trial,  
4 when you see these witnesses testify by deposition; in  
09:10AM 5 other words, when portions of those video-recorded  
6 depositions are played back to you, you are going to see  
7 and notice places where there are sections that are  
8 spliced together. There may be little jumps involved.  
9 You may hear different people's voices asking the  
09:10AM 10 questions of the witnesses. Let me explain to you why  
11 that happens.

12 In most depositions, most witnesses are  
13 questioned for up to seven hours. There may be 15  
14 minutes, 5 minutes, 30 minutes of that seven-hour  
09:10AM 15 deposition that the lawyers in this case think is  
16 important for you to hear and that they intend to  
17 present to you through that deposition witness. You  
18 don't have to listen to all seven hours to get that 15  
19 minutes or 20 minutes or whatever it is that's relevant;  
09:10AM 20 and so those video-recorded depositions will be spliced,  
21 and only the relevant portions that each side in the  
22 case wants to present to you will be played to you.  
23 That's why you may notice little breaks or splices or  
24 you may hear different voices asking the witnesses  
09:11AM 25 questions, but I want you to understand that keeps you

1 from having to listen to all seven hours' testimony of  
2 these witnesses, and it's going to save you and the  
3 Court a lot of time.

09:11AM 4 Don't focus on any jumps or skips or changes in  
5 voices. Focus on the questions that are asked and focus  
6 that are -- on the answers that are given. That, as I  
7 mentioned, is going to save everybody a lot of time.

09:11AM 8 But deposition testimony, ladies and gentlemen,  
9 is entitled to the same consideration, insofar as  
10 possible, and is to be judged by you as to the  
11 credibility, weight, and otherwise considered by the  
12 jury in the same way as if the witness had appeared in  
13 person and testified live from the witness stand.

09:11AM 14 Also, ladies and gentlemen, over the course of  
15 the trial, you are going to be shown certain documents  
16 that have been admitted by the Court as exhibits, and in  
17 some of these documents, portions are going to be  
18 blacked out or redacted. Those redactions are going to  
19 be there because the Court ordered them to be redacted.

09:12AM 20 When you see a document over the course of the  
21 trial that has portions like that or redacted, do not  
22 focus on what's been redacted. Do not speculate or  
23 guess about what's been blacked out. You should focus  
24 your attention on the remaining portions of the document  
09:12AM 25 that are there for you to see and not be confused or

1 distracted by any redactions that are in there. Again,  
2 if there are redactions, it's because I have ordered  
3 them prior to the trial.

4 Also, during the course of the trial, it's  
09:12AM 5 possible that the lawyers are going to raise objections,  
6 and when they do, I will issue and give rulings on those  
7 objections. Remember, it's the duty of an attorney to  
8 object when the other side purports or attempts to offer  
9 evidence that the attorney believes is not proper under  
09:12AM 10 the rules of the Court. However, upon allowing the  
11 testimony or other evidence to be introduced over the  
12 objection of attorney, the Court does not, unless  
13 expressly stated, indicate any opinion as to the weight  
14 or effect of that evidence.

09:13AM 15 As I've told you, you, the jury, are the sole  
16 judges of the credibility and believability of all the  
17 witnesses and the weight and effect to give to all the  
18 evidence.

19 Now, I'd like to compliment the lawyers and the  
09:13AM 20 parties on both sides of this case because prior to  
21 today, in pretrial -- in pretrial procedures before the  
22 Court, we have gone through many, many, many documents  
23 that would be potential exhibits for you to see over the  
24 course of the trial, and where there have been disputes  
09:13AM 25 over the proper admissibility of those documents, the

1 Court has heard arguments from both sides, and I have  
2 already ruled on the admissibility of those documents;  
3 and by preadmitting those documents, we have all saved  
4 you the obligation to sit here and listen to that over  
09:14AM 5 the course of the trial, and that has saved you a lot of  
6 time.

7 That means that when a document is presented to  
8 you as an exhibit in this trial, the Court has already  
9 ruled on its admissibility, so the lawyers can simply  
09:14AM 10 present it, put it in a proper context, and use it with  
11 the witness. They don't have to go through the formal  
12 presentation process, objection process, argument over  
13 the admissibility of it, and then have the Court  
14 ultimately rule on it. All of that's already been done  
09:14AM 15 in advance.

16 And whether you understand it or not, ladies  
17 and gentlemen, that saved you many hours of having to  
18 listen to that process, that you won't have to listen to  
19 in this trial, because, as I say, because of the  
09:14AM 20 cooperation and work of both sides and their lawyers  
21 with the Court in advance, that's already been done.

22 So when the parties show you an exhibit, it  
23 means I've already ruled on its admissibility, and they  
24 will ask such questions and put it in a proper context  
09:14AM 25 as they feel is appropriate.

1           However, it's still possible that objections  
2 are going to arise during the course of the trial. If I  
3 should sustain an objection to a question addressed to a  
4 witness, then you must disregard the question entirely,  
09:15AM 5 and you must not draw any inference from its wording or  
6 speculate about what the witness would have said if the  
7 I had allowed them to answer the question.

8           On the other hand, if I overrule an objection  
9 to a question addressed to a witness, then you should  
09:15AM 10 consider the question and the answer just as if no  
11 objection had been made in the first place.

12           You should understand, ladies and gentlemen,  
13 that the law of the United States permits a judge to  
14 comment to the jury regarding the evidence in the case,  
09:15AM 15 but those comments from the judge are only an expression  
16 of his or her opinion as to the evidence, and the jury  
17 is free to disregard those comments because, as I've  
18 told you several times, you, the jury, are the sole  
19 judges of the facts in this case and the credibility and  
09:16AM 20 believability of each of the witnesses and all the  
21 evidence.

22           I want you to understand, even though the law  
23 may permit me to comment on the evidence during the  
24 course of the trial, I'm going to work very hard not to  
09:16AM 25 do that. Also, you should understand that our court

1 reporter takes down everything that's said in the  
2 courtroom.

3           There may be times when two people try to talk  
4 at the same time, and I will stop them. That's because  
09:16AM 5 you cannot write down what two people are saying at the  
6 same time. But the transcription, the written version  
7 of everything that's said over the course of a trial, is  
8 not going to be available for you to consider during  
9 your deliberations after you've heard all the evidence.

09:16AM 10 The transcript is prepared in case there is an appeal of  
11 this case to an appellate court.

12           That means, ladies and gentlemen, you are going  
13 to have to rely on your memories of the evidence and the  
14 testimony that's presented over the course of the trial.

09:17AM 15           Now, in a moment, each of you are going to be  
16 given a juror notebook. In that notebook, you will have  
17 an opportunity, and you'll have a legal pad in there on  
18 which you can take notes during the course of trial, if  
19 you determine you want to take notes.

09:17AM 20           If you take notes about the testimony of the  
21 witnesses and what's presented over the course of a  
22 trial, those notes are for your own personal use. You  
23 still have to rely on your memory of the evidence, which  
24 is why you should pay close attention to the testimony  
09:17AM 25 of each and every witness.

1 A juror should not abandon his or her own  
2 recollection of the evidence because some of the jurors'  
3 notes indicate something differently. Notes, if you  
4 take them, are to refresh your recollection, and that's  
5 the only reason you should be keeping them.

09:17AM

6 All right. I'm now going to ask our court  
7 security officer to distribute these juror notebooks to  
8 each member of the jury.

9 You'll notice in these notebooks, when you get  
10 them, ladies and gentlemen, that you each have a copy of  
11 the four asserted patents that are at issue in this  
12 case.

09:18AM

13 Also you'll find in there a ledger indicating  
14 certain language from the asserted claims that the Court  
15 has construed or defined for you. You'll see the claim  
16 language on the left-hand column and the actual  
17 definition or construction that the Court has provided  
18 you on the right-hand side.

09:18AM

19 Also, you are going to find a section in there  
20 for witness pages. Those should be tabbed with a single  
21 page for each person that may testify over the course of  
22 trial, and you'll find a picture of the witness on each  
23 page, with their name underneath, and ruled lines for  
24 note-taking there, if you wish to take notes there.

09:18AM

25 You'll also find, in the back of those

09:19AM



1 notebooks, a new legal pad that you can also use for  
2 additional note-taking, and you should find a pen in the  
3 front of the notebooks in case you don't have one with  
4 you.

09:19AM

5           These notebooks, ladies and gentlemen, should  
6 be with you at all times. You should not leave them  
7 laying around. When you are in the courtroom, they  
8 should be in your possession. When you go to the jury  
9 room, you should take them with you. When you leave

09:19AM

10 each evening at the end of that day's portion of trial,  
11 the notebooks should be closed on the table in the jury  
12 room so they will be there for you the next morning.

13           Now, having said that, there may be times --

09:20AM

14 there probably will be times over the course of the  
15 trial when we will take a short recess and you are not  
16 going to be out of the courtroom very long, and in those  
17 cases, I may say to you, "Ladies and gentlemen, you can  
18 simply close your notebooks and leave them in your  
19 chairs," in which case you can do that, and you don't

09:20AM

20 have to carry them back to the jury room with you. But  
21 they are not to be left lying around. They are to be in  
22 your possession and under your control at all times.

23           All right. In a moment, we're going to proceed  
24 to hear the lawyers' opening statements for each side in  
25 the case. Opening statements, ladies and gentlemen, are

09:20AM

1 designed to give you a roadmap of what each side expects  
2 to offer by way of evidence, and you should remember,  
3 throughout the course of this trial, that what the  
4 lawyers tell you is not evidence and what the lawyers  
09:20AM 5 tell you is not -- or are not instructions on the law.  
6 Any instructions on the law will come from the Court and  
7 only from the Court.

8           The sworn testimony of the witnesses given  
9 under oath and subject to cross-examination from the  
09:21AM 10 witness stand and the exhibits that the Court has  
11 already reviewed and found admissible that are presented  
12 to you, that is the evidence in this case.

13           What the lawyers are going to tell you is their  
14 impression of what they hope the evidence will show you,  
09:21AM 15 and they have a duty to point out to you what they  
16 believe the evidence will be; but remember, what they  
17 tell you is not evidence.

18           Now, after the lawyers for both sides have  
19 given their opening statements, then we'll proceed with  
09:21AM 20 the evidence in this case. The Plaintiff will present  
21 its evidence case. The Plaintiff will call each of its  
22 witnesses. That's called the Plaintiff's case-in-chief,  
23 and when the Plaintiff has called and presented all its  
24 witnesses, the Plaintiff will rest its case-in-chief.

09:21AM 25           At that point, the Defendants will come forward

1 with their case-in-chief, and they will call their  
2 witnesses and present their evidence; and when the  
3 Defendants have called all their witnesses and presented  
4 their evidence, the Defendants will rest their  
5 case-in-chief.

6 At that point, the Plaintiff has an  
7 opportunity, if it chooses, to call additional witnesses  
8 that are called rebuttal witnesses. If the Plaintiff  
9 presents rebuttal witnesses, then those will be called  
10 to testify; and when any rebuttal witnesses have  
11 completed their testimony, then you will have heard all  
12 of the evidence, and at that time, I will give you  
13 written instructions on the law, and I will present you  
14 with a copy of those instructions for you to take with  
15 you to the jury room during your deliberations.

16 I will also send back to you, in the jury room,  
17 a verdict form with the questions that I have mentioned  
18 already that you are going to be asked to answer. These  
19 final instructions that I will give you after all the  
20 evidence is presented are called the Court's final  
21 instructions to the jury. They are also commonly called  
22 the Court's charge to the jury.

23 After I present my charge to the jury, the  
24 Court's final instructions to the jury, the lawyers will  
25 present their closing arguments; and after you've heard

1 closing arguments from counsel for the Plaintiff and  
2 counsel for the Defendants, then I will instruct you to  
3 retire to the jury room and to consider the answers to  
4 those questions and return your verdict in this case.

09:23AM

5 Let me repeat my earlier instruction to you:  
6 You are not to discuss or communicate about this case  
7 with anyone and you are not to discuss or communicate in  
8 any way about this case with each other.

09:23AM

9 Only when you've heard all the evidence, when I  
10 have given you my final instructions, when the lawyers  
11 have presented their closing arguments, and when I  
12 specifically instruct you to retire to the jury room and  
13 consider and deliberate upon your verdict, at that  
14 point, ladies and gentlemen, it's like a light switch  
15 flips and you go from not being permitted to talk about  
16 the evidence to being required to talk about the  
17 evidence among the eight of you, in an effort to reach a  
18 unanimous decision as to the questions that are included  
19 in the verdict form.

09:24AM

20 But until that time, until I specifically  
21 instruct you to retire and deliberate upon your verdict,  
22 you must not discuss or communicate in any way, among  
23 each other, anything about the trial or the evidence,  
24 and you must not at any time discuss or communicate in  
25 any way with anyone else about the trial or the evidence

09:24AM

1 in this case.

2 Also, I want to remind you of something I  
3 mentioned during jury selection, and that is over the  
4 course of this trial, it's going to be nearly impossible  
09:24AM 5 that you won't at some point come in close contact with  
6 one of the lawyers, one of the witnesses, one of the  
7 support staff for each side in this case, either coming  
8 in the entrance, on the sidewalk out front, where you  
9 parked; that's probably going to happen, and when it  
09:24AM 10 does, whoever that is, if they are associated in any way  
11 with either side of this case, they are not going to  
12 speak.

13 They are not going to be friendly. They are  
14 not going to have a conversation. They are not going to  
09:25AM 15 say, "Good morning. How are you," because I've  
16 instructed them not to.

17 Again, it is critical that when you retire to  
18 the jury room to deliberate on your verdict and to  
19 consider and answer those questions, the only  
09:25AM 20 information that you have before you to draw upon for  
21 that process is the information that you received over  
22 the course of this trial from the witnesses that have  
23 testified under oath and subject to cross-examination  
24 and the documents and exhibits that the Court has  
09:25AM 25 admitted into evidence. That must be the only

1 information that you draw upon when you answer the  
2 questions in the verdict form, and that's why I've  
3 instructed the parties and their counsel and their  
4 witnesses not to have any communication with any member  
09:25AM 5 of the jury.

6 So if that happens and somebody associated with  
7 one side or the other walks right by you, doesn't look  
8 you in the eye, doesn't smile, doesn't ask you how  
9 you're doing this morning, don't hold that against them.

09:26AM 10 Don't think they are being rude or unfriendly. Just  
11 remember they are simply following the Court's  
12 instructions to you.

13 All right. With that, we will now proceed with  
14 your opening statements from counsel for the competing  
09:26AM 15 parties.

16 Plaintiff, you may present your opening  
17 statement to the jury.

18 MR. HUESTON: Thank you, your Honor.

19 THE COURT: Would you like a warning on your  
09:26AM 20 time, Mr. Hueston?

21 MR. HUESTON: Yes, your Honor. Two minutes.

22 THE COURT: I'll warn you when you have two  
23 minutes remaining. You may proceed with Plaintiff's  
24 opening statement.

25 ///

1 PLAINTIFF'S OPENING STATEMENT

2 MR. HUESTON: May it please the Court.

3 Good morning, ladies and gentlemen. This case  
4 is about a special company that invents things and it's  
09:26AM 5 about two inventors who worked at that company who came  
6 up with a brilliant idea, a breakthrough invention that  
7 helps the cell phone in your pocket run faster and use  
8 less battery power.

9 Samsung has been using this invention in its  
09:27AM 10 electric devices for years without paying. You have the  
11 power today to say that this special company that's  
12 dedicated to inventing needs to get paid what it's owed.

13 Now, the story of this invention starts with  
14 the inventors and the special company that helped them,  
09:27AM 15 and that's called Acorn Technologies. Acorn was founded  
16 right here in the United States in 1998, about 20 years  
17 ago, and it had a special vision. It wanted to try to  
18 solve the world's most important technical problems, and  
19 its mission is just like its name.

09:27AM 20 Acorn was trying to find the great ideas, the  
21 acorns, and then by investing time, money, and bringing  
22 in inventors, it tried to grow those ideas into real and  
23 practical inventions, the oak trees. It would take many  
24 years to do that.

09:28AM 25 The CEO of Acorn is Mr. Tom Horgan, and

1 Mr. Horgan, if you can stand up, please.

2 Mr. Horgan will testify a little later today,  
3 and he's going to tell you that he invested in research  
4 and development, he hired brilliant inventors, and when  
09:28AM 5 they came up with a great idea, he protected them with  
6 patents. And when they found that 1-in-1,000  
7 breakthrough idea, they worked to bring it to market.

8 Now, you are going to hear this is a tough  
9 business. A lot of ideas fail. Other ones take years.

09:28AM 10 They think ahead of the technology years ahead of  
11 industry, and it takes years for industry to catch up  
12 and appreciate what they've done, and that's true in  
13 this case. It takes time, patience, and the investment  
14 of a lot of money before you might ever eventually see a  
09:29AM 15 return.

16 Last and finally, hiring the two brilliant  
17 inventors in this case who created the invention, and  
18 they are Dr. Daniel Grupp and Dr. Daniel Connelly. A  
19 little later this morning, you are going to hear from  
09:29AM 20 Dr. Connelly, and you are going to find him, I think, to  
21 be a very interesting person. He has been an inventor  
22 his whole life.

23 You'll hear that he invented a way to take  
24 blood clots out of a body. He invented a way to bring  
09:29AM 25 portable malaria kits that are now being used in



1 different parts of the world, and you will hear that  
2 when he was at Acorn, he was focused on semiconductors,  
3 trying to find a breakthrough, and his partner there was  
4 Daniel Connelly, and you'll hear he was equally as smart  
09:29AM 5 and knew everything about physics, and the two of them  
6 worked together to create the breakthrough invention in  
7 this case.

8 Now, before I tell you about the invention,  
9 we're going to be going inside the phone here, and I've  
09:30AM 10 got to talk to you about a couple of things that are  
11 going to come up inside the phone.

12 First of all, inside your phone is something  
13 called the processor. That's the brain of the phone,  
14 and it's a computer chip; and inside that computer chip  
09:30AM 15 are all these tiny little transistors. Those are little  
16 electrical switches. There are actually billions of  
17 them inside your phone, and if you look over there to  
18 the call-out on the right, it says, "Metal, silicon, and  
19 metal"; that's inside one of those transistor chips.

09:30AM 20 Those transistors are connected together with bits of  
21 metal, and electricity has to run from the metal to the  
22 silicon to the metal.

23 Now, you're going to hear it's hard for the  
24 electricity to jump from the metal to the silicon and  
09:30AM 25 back again. I'm going to show you an illustration right

1 now. See how the electricity kind of gets stuck a  
2 little bit as it goes from the metal to the silicon and  
3 then silicon to the metal. It's kind of slowing down.  
4 It's like it's running uphill. That's called contact  
09:31AM 5 resistance. And see what happened to the battery? The  
6 more contact resistance, the harder it is for that  
7 electron to jump from metal to silicon and back around  
8 again, the faster your battery runs down.

9 The semiconductor industry knows this is a big  
09:31AM 10 problem, and they all tried to reduce contact  
11 resistance. If you can reduce contact resistance, the  
12 electrons will move through faster and your phone won't  
13 run down. That's exactly the problem that Drs. Grupp  
14 and Connelly solved; they figured out a way to reduce  
09:31AM 15 that contact resistance.

16 Now, you'll hear at the time everybody was  
17 trying to work on this -- and you see that metal and  
18 silicon? What everybody thought at the time was if you  
19 just push that metal and silicon together and get it  
09:32AM 20 together as smooth as you can, that will be the way to  
21 reduce contact resistance. Those electrons will move  
22 fast. But it wasn't working.

23 So Dr. Grupp and Connelly worked day and night,  
24 blackboards, thinking, "How can we overcome this  
09:32AM 25 problem," and they came up with a solution that no one

1 else was thinking about. Instead of trying to push it  
2 together, they thought, "What if we make a separation  
3 between the metal and silicon, pull them apart, and put  
4 an insulating layer in between. That will make -- in  
5 the world of quantum physics, that will make it easier  
6 for those electrons to move."

7           So here's what they thought of. Look at that  
8 metal and silicon. They made a gap, they put in that  
9 insulating layer that you see in color there, and look,  
10 the electrons are moving quickly and the cell phone is  
11 not running down on its battery. That was the  
12 invention.

13           Now, ladies and gentlemen, they didn't just  
14 think of this idea; they tested it. And when they did  
15 their initial tests, it really worked. They reduced  
16 contact resistance more than 20 times lower than the  
17 industry's highest standard at the time. It was a true  
18 breakthrough moment.

19           Now, those inventors in Acorn knew they had a  
20 great invention, and so what they did is they then  
21 applied for a patent to protect it. They filed, and  
22 you'll see they got their first patent in 2006. And you  
23 will see, ladies and gentlemen, that in the  
24 United States Constitution, our Founding Fathers have  
25 protected the ideas of patents for over 200 years. They

1 knew how important it was, how necessary it was, the  
2 patent system, for innovation and invention, how  
3 necessary the patent system is to protect inventors like  
4 Drs. Grupp and Connelly and Acorn and reward them for  
5 their inventions; and that reward is you can't use the  
6 patented invention without permission, without paying  
7 for it.

8 And, by the way, it doesn't matter that the  
9 inventor can't manufacture something, doesn't have the  
10 money or ability to do that. It protects the small  
11 ones, too, who can invent and come up with great ideas.

12 Now, Acorn, in fact, received other patents  
13 related to this invention. You'll see them here. And  
14 these patents, ladies and gentlemen, are strong patents.  
15 You heard in that video that you saw about patents that  
16 the Defendant can actually challenge the patents. They  
17 can say, "You know what? The U.S. Patent Office got it  
18 wrong; these are not valid patents."

19 Well, at this trial, these patents are so  
20 strong that Samsung hasn't challenged any one of them  
21 here at trial. These patents, in fact, and this  
22 invention was so powerful, Samsung was paying attention  
23 and knew how strong it was for years, and I'll show that  
24 to you.

25 After Acorn began putting out patents relating

1 to this invention, Samsung, you'll hear, was talking  
2 about these patents in its own patents. "Prior art,"  
3 you heard that. That's kind of a fancy term for, "It's  
4 a building block of their own invention." They were  
09:35AM 5 acknowledging the importance early on. And not only  
6 that, Acorn, on top of these patents, they were  
7 publishing scientific papers talking about the  
8 invention.

9 And you'll hear that everybody was looking at  
09:35AM 10 this. Drs. Grupp and Connelly published two papers, and  
11 scientists and engineers around the world continue to  
12 look at these papers, talk about the invention, and  
13 write about it. There have been over 300 papers being  
14 written about Grupp and Connelly's invention, and you  
09:36AM 15 know who's in those 300 people? Samsung engineers.  
16 They have been writing about it, too, and you'll see it.  
17 I'll show you evidence in this trial. 2013 is one  
18 instance where Samsung was talking about, in writing,  
19 about this invention.

09:36AM 20 Now, I mentioned earlier this was a  
21 breakthrough invention; it was way ahead of its time.  
22 Let me give you a little history reminder. I often  
23 forget. You know, Apple didn't release its first iPhone  
24 until 2007, six years after this invention, and Samsung  
09:36AM 25 took another three years to get out their first phone,

1 in 2010.

2 It wasn't for another few years that the  
3 industry would really have a need for this invention,  
4 because those transistors I showed you earlier were  
09:37AM 5 getting smaller and smaller and smaller, and those  
6 electrons were having trouble getting through; they had  
7 contact resistance.

8 It's kind of like this picture here. You've  
9 probably all gone through one of those big toll ways  
09:37AM 10 like this. This one's got twelve lanes, and then you  
11 come out of it, and you're kind of getting squashed  
12 going into two or three lanes. What happens when you're  
13 driving your car, then? You're kind of slowing down and  
14 it's getting crowded.

09:37AM 15 Well, that's what was happening as these  
16 transistors were getting smaller and smaller and  
17 smaller. The electrons were having trouble getting  
18 through. Contact resistance was the big problem people  
19 were trying to solve.

09:37AM 20 And we'll show you Samsung's internal documents  
21 which they talk about it as the biggest problem. Here's  
22 an example: In 2014 they are saying, inside Samsung,  
23 "Contact resistance dominates device performance." What  
24 that means is contact resistance is our biggest problem.

09:38AM 25 But somehow, a year later, when they release

1 their new, tiny transistor, they have solved the problem  
2 and they brag to the world, like in this document:  
3 "This newest process enables up to 20 percent faster  
4 speed, 35 percent less power."

09:38AM

5 Well, ladies and gentlemen, guess how they did  
6 that. One of the ways they did it was using Grupp and  
7 Connelly's invention. And how do we know that? We cut  
8 open one of their chips inside their phone and found it.

09:38AM

9 Now, to do that, we had to get a specialist in,  
10 with the right kind of equipment, and you are going to  
11 hear at this trial from Dr. Edward Piner. He's a  
12 professor of physics at Texas State. He has more than  
13 ten years' experience in the area, and he's published  
14 papers about semiconductors, and he himself has invented  
15 over 30 inventions.

09:38AM

16 You'll see, and it will be kind of fun, he'll  
17 talk to you about how he cut open the phone, went  
18 inside, and tried to -- and did find the chip to look  
19 at, to try to examine it, to see if he could find the  
20 invention. And to do that, he had to use that gigantic,  
21 big microscope there on the right to look inside.

09:39AM

22 Now, to figure out if he was finding the Grupp  
23 and Connelly invention, he needed a roadmap, and the  
24 roadmap comes from the patent.

09:39AM

25 So here's one of the patents, and it has a lot

1 of words and jargon on it, but as you can see from those  
2 green checks, Samsung, we think, is not even going to  
3 argue that they were doing all those things. They are  
4 going to focus on the last point there, and that last  
09:39AM 5 point looks like a lot of jargon, too.

6 But the judge is going to give you a specific  
7 definition of that. He's going to say what you need to  
8 look for is a layer of oxide titanium -- that's oxygen  
9 connected to titanium -- and a distinct layer of  
09:40AM 10 silicon. Look for the layers.

11 So Dr. Piner went and looked for it, and he  
12 looked through that gigantic microscope, and guess what  
13 he found. Here we are inside the transistor, ladies and  
14 gentlemen. Remember I showed you that diagram earlier?  
09:40AM 15 There's the metal at the top, there's the silicon at the  
16 bottom, and look between; there's the gap that Grupp and  
17 Connelly talked about, and there are the layers: a  
18 layer of titanium silicon oxide and a layer of silicon  
19 oxide.

09:40AM 20 Let me take the colors off. Take a look at it  
21 again. The colors help direct your eyes. There it is  
22 without the colors; there it is with it. Let's do a  
23 close-up. Dr. Piner will do this to you. Look to the  
24 left. There I put the colors on in blue and then in  
09:40AM 25 green. Take a look at that. Do you see the layers when



1 I take the colors off? Let me put it back again. Your  
2 eyes won't deceive you. You are seeing Grupp and  
3 Connelly's invention right there.

09:41AM 4 In fact, Dr. Piner made sure that it was  
5 titanium oxide and silicon oxide. He did what's called  
6 an elemental analysis, and he confirmed in that chart on  
7 the right, those two double bumps, that's oxygen.  
8 There's silicon oxide in one layer, titanium oxide in  
9 the other.

09:41AM 10 Ladies and gentlemen, you're staring at Grupp  
11 and Connelly's invention right inside the Samsung phone.  
12 This isn't the only picture you are going to see with  
13 Samsung caught with its hand in the cookie jar. You are  
14 going to see a picture of it from their own expert,  
09:41AM 15 Jeffrey Bokor. Take a look at this one.

16 There you can see the silicon on the bottom,  
17 dark. You can see the metal on the top, and look at  
18 those layers in between. It's like that layer cake.  
19 Let me help you there with the colors again. Focus your  
09:42AM 20 eyes on that. You see the blue and green? Now I'll  
21 take it off. And ask yourself, are you seeing the  
22 layers? Your eyes won't deceive you.

23 They are going to wave their arms around and  
24 Dr. Bokor's going to say, "Well, these layers really  
09:42AM 25 aren't there." Trust your eyes; trust the documents.

1 Now, as you can see, Samsung has been caught  
2 red-handed with the Grupp and Connelly invention, but  
3 they don't want to pay any money, so they are going to  
4 give you a series of excuses to try to convince you to  
5 let them off the hook. I'm going to review a few of  
6 them with you now.

7 Believe it or not, the first thing you are  
8 going to hear is there actually isn't any oxygen in  
9 there. Now, this is like the kid who caught his hand in  
10 the cookie jar, and you're like, "Hey, you got your hand  
11 in the cookie jar," and the kid goes, "No, I don't."

12 Yeah, that's kind of cute when you talk to your  
13 kid, but it's not funny in business. And what you are  
14 going to see is this person, David Moreau from Samsung.  
15 He's going to tell you, "My hand's not in the cookie  
16 jar. There's no oxide there at the interface," at the  
17 level we just showed you. But his documents, their own  
18 documents show the opposite.

19 We'll show you documents from Samsung like this  
20 one, where they are finding oxygen in those layers.  
21 It's right there in front of them: Titanium oxide,  
22 silicon oxide. They will say it's not there, but their  
23 own documents will show it's a lie.

24 Next excuse: "Well, maybe there's oxygen, but  
25 there's not enough to be oxide layers." Now, this is

1 like the kid who is caught with his hand in the cookie  
2 jar that says, "No, I'm not grabbing a cookie; I'm just  
3 grabbing a crumb." This also is not true, and you'll  
4 see it from their own documents.

09:44AM

5 Here's an example. Talk about caught  
6 red-handed, oxygen in a -- see the "IL"? That means,  
7 "Interface layer." Oxygen in the layer. There it is  
8 again and again, oxygen in the layer. And at the  
9 bottom, the interface layer top is the silicon oxide  
10 that has been oxidized, their own documents showing it's  
11 there.

09:44AM

12 Next excuse, "Well, we know there are oxide  
13 layers, but we took them out starting in 2017, and they  
14 are not there anymore." Now, that's like the kid caught  
15 with his hand in the cookie jar, and he says, "Okay.

09:44AM

16 Look, you know, I haven't gone back in that cookie jar  
17 for a couple weeks. Don't worry; I'm not going there."  
18 And then you walk into his bedroom and you see some  
19 cookies. That's exactly what happened here with

09:44AM

20 Samsung.

21 You are going to hear from the expert. He's  
22 going to say, "Hey, once we took this special step out  
23 of our complicated processes, those oxide particles were  
24 no longer there." Well, that's wrong. Their own  
25 documents are going to show they're still there. They

09:45AM

1 did their own tests afterwards. When they took out the  
2 special test, you'll see it here, a year later, after  
3 2017; here we are, January 2018. Their tests are going  
4 to show, boom, oxide, oxygen, there on the left; boom,  
5 and there on the right, oxygen. The documents will show  
6 the truth.

7           Next excuse, "Well, actually, we really don't  
8 want this here." You may hear them say something like,  
9 "This is like rust. We don't really want this in our  
10 process. We'd like to just -- we don't want it. We've  
11 been trying to get rid of it."

12           Now, this is like the kid caught with his hand  
13 in the cookie jar that says, "Yeah, I don't even really  
14 like those cookies, Mom and Dad. I promise you, I won't  
15 be eating those again," and then two weeks later, caught  
16 with his hand in the cookie jar again. That's exactly  
17 what's happened here, ladies and gentlemen.

18           You are going to see, from their internal  
19 documents, their engineers figured out a way to take the  
20 oxygen out. They said, "Here's how you can do it." And  
21 you know what Samsung chose to do? Keep the oxygen  
22 there. They decided not to take it out because they  
23 knew the invention worked. You'll see it. They will  
24 also tell you, "Hey, we had this task force in 2014. It  
25 looked into oxygen, and they decided in the task force

1 they didn't want the oxygen in there." But you'll learn  
2 that task force was looking at another chip, not the one  
3 related to our invention.

09:46AM 4 And more importantly, after they said that, we  
5 caught them with oxygen in their chips again and again,  
6 in 2015, in 2017. They still haven't gotten rid of it  
7 because they know it works.

8 Now, ladies and gentlemen, they will have one  
9 more excuse for you. They will say, "Well, people  
09:46AM 10 aren't really interested in this invention. Nobody else  
11 has taken a license to it." Now, this is like the kid  
12 who was caught with his hand in the cookie jar, and he  
13 says, "You know, Mom, Dad, brothers and sisters, they  
14 don't like the cookies, so I did everybody a favor and  
09:47AM 15 ate them all." That's what Samsung's doing here, ladies  
16 and gentlemen.

17 You are going to hear that the industry was  
18 very interested, but this invention was ahead of its  
19 time. Some of those companies didn't have the right  
09:47AM 20 technology. It didn't fit. Other companies are still  
21 talking to Acorn today. But the company that's most  
22 interested in this invention is sitting right here; it's  
23 Samsung. How do you know that? We'll show you.

24 Samsung actually will tell you here in trial,  
09:47AM 25 "We had no knowledge of Acorn's patents until the

1 lawsuit was filed in 2019." That's also false, over and  
2 over again. Samsung was talking about patents in the  
3 same family of the invention in 2009 and 2010.

09:48AM 4 Samsung actually, as I talked to you earlier,  
5 in their papers, they are called the Samsung Advanced  
6 Institute of Technology. They were talking about this  
7 invention, and there it is, Connelly and Grupp, in their  
8 papers. They knew about the invention, and they knew  
9 about it earlier.

09:48AM 10 And they will tell you they even studied the  
11 invention in 2014, when they came up with that task  
12 force, and they will say, "Well, that's when we said we  
13 didn't want the oxygen," but then, as I just showed you,  
14 we found the oxygen afterwards, over and over again.

09:48AM 15 And that's not all. Even after that,  
16 Samsung's still talking about the invention in papers  
17 they published in 2017 and 2018. Again and again, we'll  
18 show you example after example where they are talking  
19 about this invention.

09:48AM 20 Now, after they kept talking about that  
21 invention again, we'll show you internal documents, the  
22 oxygen's still there. What are they trying to do with  
23 their chips? They are trying to make them as fast as  
24 possible. If they really thought the oxygen was  
09:49AM 25 dragging it down, rust they wanted to get rid of, and

1 they had the ability to get rid of it, they would have  
2 done so. When they leave it in, it's because they know  
3 it's best for their chip. They have been working for  
4 years on it.

09:49AM

5 Ladies and gentlemen, they not only cite this  
6 in those -- in those articles, they cite the patent  
7 family in their own patents. They know it's a building  
8 block for their own invention. 2009, 2010, 2017, 2018,  
9 and again in 2018, they talk about the invention, again  
10 and again. Boy, did they know about the invention.

09:49AM

11 They are going to have paid experts and other  
12 people up here trying to convince you otherwise today.  
13 Just keep your eyes on the evidence.

09:50AM

14 Now, Samsung has been caught with its hand in  
15 the cookie jar. Your eyes don't lie. They are showing  
16 you the inventions there. Make sure you keep focusing,  
17 ladies and gentlemen, on the documents and things that  
18 happened before the lawsuit, not what the paid experts  
19 say to you here at trial.

09:50AM

20 So since they have been caught red-handed and  
21 they haven't paid a cent, the question for you is going  
22 to be, well, what's fair? What should Acorn have been  
23 paid? Now, you'll see the United States law says the  
24 minimum that should be paid, the absolute minimum, is  
25 something called a reasonable royalty.

09:50AM

1           So what is a reasonable royalty? That's kind  
2 of a fancy term for a rent payment. So if you wanted to  
3 live in this building here and you had to pay rent,  
4 well, you pay rent for every month you're there. The  
09:50AM 5 longer you're there, the more rent you're paying.

6           Well, same thing when you use somebody's  
7 invention. You call it the license agreement, and you  
8 pay as you use it. The more you use it, the longer you  
9 use it, the more you owe.

09:51AM 10           Now, how do we figure out how much they ought  
11 to pay? We had to bring in an expert to take a look to  
12 try to figure out, well, what would a reasonable royalty  
13 have been if Samsung had done the right thing and sat  
14 down and tried to pay what was right? And you're going  
09:51AM 15 to hear from Stephen Dell. He's a professor at the  
16 University of Texas, and he's going to tell you he  
17 really looked at this. He's got lots of experience, 19  
18 years in consulting, he's a certified valuation expert,  
19 and he's going to tell you that Samsung has sold over  
09:51AM 20 \$9 billion of wafers. That's just a fancy -- I think,  
21 like, a cookie when I hear a wafer. It's like these big  
22 sheets with chips on them, and every chip has the Grupp  
23 and Connelly invention. They have sold over \$9 billion  
24 worth.

09:51AM 25           And he will tell you when he looked at all the



1 factors, he thought 3 1/2 cents on the dollar would be  
2 the minimum reasonable royalty for the contribution of  
3 the Grupp/Connelly invention for the success of Samsung  
4 with this. And when you apply 3 1/2 percent, 3 1/2  
5 cents on the dollar to 9 billion, you come up with  
6 \$326 million.

7 Ladies and gentlemen, what has happened here is  
8 very serious. You have the power to do what's right by  
9 a company whose invention was stolen and used by Samsung  
10 to help make their phones and electronic devices run  
11 faster with less battery power. You have the power to  
12 say, "It's time for the excuses to end. It's time to  
13 make things right."

14 Thank you for your time and attention.

15 THE COURT: Defendants may now present their  
16 opening statement to the jury. Mr. Cordell, would you  
17 like a warning on your time?

18 MR. CORDELL: I would, your Honor. Could I  
19 have five minutes?

20 THE COURT: I'll warn you when you have five  
21 minutes remaining.

22 MR. CORDELL: Thank you.

23 THE COURT: Please proceed when you're ready.

24 MR. CORDELL: Thank you, your Honor.

25 ///

1 DEFENDANTS' OPENING STATEMENT

2 MR. CORDELL: Ladies and gentlemen, good  
3 morning. My name is Ruffin Cordell, and along with my  
4 colleagues, Ms. Smith and Michael McKeon and Mark  
09:53AM 5 Fowler, we are proud to stand before you and represent  
6 Samsung. And like Ms. Smith and his Honor did during  
7 the jury selection, the first thing I want to do is to  
8 thank you for your service.

9 Jury service -- I echo what Judge Gilstrap  
09:53AM 10 said -- is the highest form of civic duty that we have  
11 in this country. We're lucky to have it. It's what  
12 makes us unique. It's what allows us to settle disputes  
13 in a straightforward manner. And we know you have busy  
14 lives and you have other things you could be doing this  
09:54AM 15 week, but on behalf of Samsung, we really appreciate it.

16 And, you know, one of the things Ms. Smith said  
17 at jury selection that struck me is that, you know, when  
18 your kids come running to you and there are two of them  
19 there, they -- you know, the first one that starts  
09:54AM 20 talking tells the story -- and I should tell you, I have  
21 three children of my own. My wife and I have been  
22 married for 32 years, so I've been through this. And,  
23 you know, it's important to get both sides of the story.  
24 And you heard his Honor this morning instruct you that  
09:54AM 25 you are to keep an open mind, and that's what we're

1 going to ask.

2 Because we heard a lot from Mr. Hueston on  
3 behalf of Acorn, and I'm going to respond to that; but  
4 importantly, you are going to hear the evidence. You  
09:55AM 5 are going to hear the evidence from Acorn first and then  
6 you are going to hear the evidence from Samsung.

7 So we're going to ask you to keep an open mind.  
8 And my job for the next half-hour is to preview that  
9 evidence for you a little bit to kind of show you where  
09:55AM 10 it all fits into this overall dispute. So I'm going to  
11 try to do that.

12 Now, you heard a lot about different claims and  
13 whatnot, and I'm going to take you through it, you know,  
14 one piece at a time, but let me cut to the chase, ladies  
09:55AM 15 and gentlemen. Samsung doesn't use Acorn's patents.  
16 There's just no infringement in this case, and the  
17 evidence is going to show you, over the next few days,  
18 that Samsung just does this contact resistance that  
19 Mr. Hueston talked about in a different way.

09:55AM 20 And there are 11 million patents out there.  
21 They just issued the 11 millionth, and each one is very  
22 particular as to what it covers. So we're going to look  
23 at that patent claim that's at issue in this case, those  
24 claims, and I'm going to show you Samsung 's technology,  
09:56AM 25 and I hope, at the end of this, you'll agree with me

1 that there's just not.

2 Now, we heard a lot about Acorn from  
3 Mr. Hueston, but I'd like to tell you a little bit about  
4 Samsung. So many of you know Samsung. You've got some  
09:56AM 5 of their great products, their phones, their  
6 televisions, their appliances, and they make great  
7 stuff. But they started out very humbly back in 1938,  
8 when Byung-chul Lee started the company as a small  
9 trading company, and it took decades of work,  
09:56AM 10 innovation, and investment to build it into the company  
11 that gives us these great products.

12 Now, you know, South Korea is a lot like the  
13 U.S., and Mr. Lee was lucky enough to have been born  
14 there in a country where you can worship as you choose  
09:56AM 15 and you can work as you choose and you can enjoy the  
16 same freedoms that we have in the U.S. South Korea is  
17 actually patterned after the U.S. in a lot of respects,  
18 and it was that freedom that allowed Mr. Lee to build  
19 Samsung into the company we know today. And it's been  
09:57AM 20 successful. You know, there's no question about that.  
21 We heard some of that from Mr. Hueston. They have got  
22 100,000 patents of their own, Samsung does.

23 But you might ask yourself, why are we here?  
24 How did this get to Texas? And the answer's pretty  
09:57AM 25 simple, and it has to do with this factory. So what

1 I've got up on Slide 2 is Samsung's Austin Semiconductor  
2 factory. We call it a "fab," which is short for  
3 "fabrication facility," a factory. And this Samsung  
4 Austin fab is just to the west of here, has about 3,000  
09:57AM 5 employees, and they make 90 percent of all the products  
6 that you are going to hear about in this case. They are  
7 made right here in America.

8 And, you know, Samsung's a little different.  
9 In the last few years, we heard a lot about offshoring  
09:57AM 10 jobs and companies, big companies sending our jobs  
11 overseas. Well, Samsung did just the opposite, ladies  
12 and gentlemen. They took those jobs and they moved them  
13 to the States, and so we're lucky enough to have  
14 Dr. Jason Reifsnider here with us who is the director of  
09:58AM 15 engineering manufacturing at the Samsung Texas facility,  
16 and you are going to hear from him a little later.

17 But what they do at this factory is really, in  
18 my experience, it's nothing short amazing. It is the  
19 most technologically advanced place, I think, in human  
09:58AM 20 history. This facility, which covers eight football  
21 fields, is where they manufacture all of the chips you  
22 are going to hear about in this case.

23 So what do these chips look like? So we'll  
24 start with the wafers. So the way these things are made  
09:58AM 25 -- and it is a fascinating process; you are going to

1 hear about it from the witnesses -- is they take pure  
2 silicon. They actually melt it and draw it up so it's  
3 just one crystal. And Mr. Raifsnider is actually going  
4 to show you one of these wafers, and it shines like a  
09:59AM 5 mirror, it's so pure. And then after using a series of  
6 steps, layer upon layer, they take some material off,  
7 they put some material on, and they build up the layers  
8 that make the circuits that end up creating the chip you  
9 see on the right.

09:59AM 10 And Mr. Hueston said, "Well, these things are  
11 very complicated," and he's right. That one chip has,  
12 you know, 100,000 times the processing power of the  
13 computers that we put into Apollo that put people on the  
14 moon, just in that one little chip. There are billions  
09:59AM 15 and billions of transistors, and they can switch on and  
16 off billions of times a second. It's a remarkable,  
17 remarkable process.

18 If, when they are making these chips, if they  
19 are off by just a few atoms, the whole chip won't work.  
09:59AM 20 The whole wafer has to be thrown away. It takes three  
21 months to make one of these wafers. So we're going to  
22 talk about that process some today.

23 But now let's focus in on the transistor  
24 itself. And, you know, most of us don't ever even have  
10:00AM 25 to think about what a transistor is. Well, a transistor

1 is nothing but a switch. It's just like a light switch  
2 on the Court's wall right there. What it does is it  
3 allows you to turn electricity on or turn it off. The  
4 difference is this thing is really, really tiny.

10:00AM

5 So we have -- we call it a 14-nanometer, which is just a  
6 word for a very small distance -- FinFET transistor, and  
7 14 nanometers, ladies and gentlemen, just to give you  
8 some perspective, is about a half of a millionth of an  
9 inch. So obviously, it's really, really tiny. And as

10:00AM

10 they have gotten tiny, it's become challenging to do  
11 things like, "How do we wire up the switch? How do we  
12 get electricity to the switch so it can turn on and off  
13 as it's supposed to?" And we're going to focus on that  
14 a lot in this case.

10:00AM

15 And basically what we're going to focus on is a  
16 very particularized part of this, and it has to do with  
17 where that wire comes into the switch. And so in the  
18 drawing that I have up on the slide, you can see that  
19 there are these two metal cylinders, these two

10:01AM

20 silver-colored cylinders. Those are basically the  
21 wires. They are called plugs; the engineers call them  
22 plugs, but they are just metal cylinders, is what they  
23 are. And those metal cylinders go down and they meet  
24 the transistor at a place that the engineers call the

10:01AM

25 source/drain, and they do that on both sides. You can

1 see there are two cylinders. One's a source and one's a  
2 drain.

3 Source/drain, to me, is hard to follow, but the  
4 shape that they go into kind of looks like a mushroom,  
10:01AM 5 so I call it a mushroom cap, just to make it easy. And  
6 so what we're going to be talking about in this case  
7 over and over and over again is this region right here,  
8 where that metal cylinder, where that wire comes into  
9 the switch, sort of like when you would screw the wire

10:01AM 10 into the wall switch on the Court's wall. We're going  
11 to be looking at where that cylinder comes into the  
12 semiconductor, where it comes into that mushroom, and  
13 that contact point is going to be the entire focus of  
14 this case. So we're not going to have to talk about all  
10:02AM 15 of the amazing other parts of this, because there are  
16 quite a few, and that's going to help us. So we're  
17 going to have a much more focused discussion in this  
18 case.

19 So looking at that -- and I apologize because  
10:02AM 20 this is kind of vertical, right? I got the metal  
21 cylinder coming in, the wire coming in, and the  
22 semiconductor that's upside down, and then for some  
23 reason, we turn it to the side, I think because it makes  
24 it a little easier to talk about.

10:02AM 25 But what the Acorn patents are all about



1 is that meeting between the metal and the semiconductor.  
2 And Mr. Hueston was right that the inventor has said,  
3 "Well, let's separate it apart," but he kind of left  
4 something out, because they don't just separate them.  
10:02AM 5 They don't just put a little space between the metal and  
6 the semiconductor. They fill it with two very, very  
7 important things, and you are going to hear about this  
8 over and over again, because the Acorn patents, in order  
9 to infringe the Acorn patents, you've got to find two  
10:03AM 10 things. You've got to find a layer of metal oxide, and  
11 they often talk about titanium oxide. Titanium's a  
12 metal. So a layer of metal oxide and a layer of  
13 semiconductor oxide. You've got to have both layers  
14 between the metal and the semiconductors. Not just any  
10:03AM 15 layers. It's not just oxygen. I heard Mr. Hueston say,  
16 "Oh, there's oxygen here or there." No, ladies and  
17 gentlemen, oxygen is not what the claim talks about.  
18 The claim talks about an oxide, and you absolutely have  
19 to find it, if we're going to find infringement in this  
10:03AM 20 case.

21 Now, this is all going to be very technical,  
22 and I apologize about that. I've learned a lot in this  
23 case. That's probably the coolest part of my job is I  
24 get to learn new things all the time. And you are going  
10:03AM 25 to learn a lot about semiconductor processing. But some

1 of this you already know.

2           So what we're talking about, when we're putting  
3 these oxides right in the pathway of the electricity,  
4 is, at least when I first encountered it, it didn't make  
10:04AM 5 a lot of sense to me. What do I know? I know that when  
6 my battery goes bad and I go take it to the store to  
7 look at it, the first thing they do is they take the  
8 cable off and they take a scrub brush and this round  
9 thing and they clean the terminal off. Why? Because  
10:04AM 10 oxide may have built up between the cable and the  
11 battery terminal, and that's what's making my battery  
12 dead because we know that oxide's not good for  
13 electricity; it doesn't like to flow through an oxide.  
14 It's an insulator, we hear, and it stops the flow of  
10:04AM 15 electricity.

16           But, ladies and gentlemen, that's what these  
17 claims talk about. These claims require two different  
18 kinds of oxide: that metal oxide and that semiconductor  
19 oxide in layers. They have to completely separate the  
10:04AM 20 semiconductor and the metal. And that was the invention  
21 that Acorn came up with.

22           And, look, they have their patents. That's  
23 great. You know, we have patents, too. We all believe  
24 in patents. But they decided to patent something that,  
10:05AM 25 frankly, just doesn't work for Samsung.

1           So what does Samsung do? Samsung says, "We  
2 don't think oxides are a good idea. We don't think  
3 putting two layers of oxide in the path of our  
4 electrical current is going to help. We think it makes  
5 it worse. It's going to be like your car battery.  
6 You're going to have to go clean that out of there."

7           So Samsung does something different, and they  
8 use a term -- and you are going to hear this just all  
9 through this case -- called silicide. And I have to  
10 admit, when I first heard that term, I thought roach  
11 spray, right? I mean, silicide would be a good name for  
12 it, but it's not.

13           What silicide is, again, it's complicated, but  
14 in another way, it's actually very simple. So when that  
15 metal bar comes up against the semiconductor, it turns  
16 out that the metal in that bar, titanium, will react  
17 with the semiconductor, the silicon. Actually, it's  
18 like a little chemical reaction, and it forms this thing  
19 called silicide.

20           And so what you end up with is, instead of  
21 having the separation that Mr. Hueston talked about, you  
22 bring them absolutely together. You bring them together  
23 at a molecular level. You can't bring them any closer.  
24 And that's what Samsung does; it uses this metal  
25 silicide in that contact between the metal and the

1 semiconductor, and it doesn't want oxide. In fact, if  
2 there's oxide there, the silicide won't form. So  
3 Samsung makes sure there's no oxide at that interface.

4 So what we really have here is a tale of two  
10:06AM 5 companies, a tale of two cities. We have Acorn saying,  
6 "Oxide's a good thing. "You should put oxide in your  
7 products"; and we have Samsung saying, "Don't use oxide;  
8 it's bad; and, instead, we're going to use silicide."

9 And you are going to hear the inventors, you  
10:07AM 10 heard -- you're actually going to hear from Dr. Grupp  
11 today, not Dr. Connelly, but you are going to hear from  
12 these inventors that their patents don't cover silicide.  
13 We think that's going to be very important.

14 So let's talk a little bit about patent  
10:07AM 15 infringement. So, you know, most of us have never  
16 encountered patent infringement in our regular lives,  
17 right? Doesn't come up every day. And his Honor gave  
18 you some instructions about what it means to infringe a  
19 patent, but I just want to illustrate that a little bit.

10:07AM 20 So every one of these patents has claims in it,  
21 and the claims are what matter. His Honor told you  
22 about that, but that's the actual property that people  
23 have. It's not the written part of the patent in the  
24 front; it's not the drawings. The claims are what  
10:07AM 25 matter.

1 And my patent here is on a soccer ball, and  
2 it's -- my claim says, "Made of leather and stitched  
3 together and filled with compressed air, and it's  
4 round." And, you know, you might think of an old  
10:08AM 5 Pete Maravich-style basketball. It may even fit this,  
6 right? It's made of leather, it's stitched together,  
7 it's filled with compressed air, and it's round, made  
8 with leather. But what if Mr. Hueston comes up with a  
9 different ball and he has a football? While it's made  
10:08AM 10 of leather, it's stitched together, it's filled with  
11 compressed air -- outside of Tom Brady, it's filled with  
12 compressed air, but it's not round. It's not round,  
13 ladies and gentlemen.

14 So if there's a difference, if there's a  
10:08AM 15 missing element, then there's no infringement. And  
16 that's the way it works. That's the way the law works.  
17 So your task is going to be to look at these patent  
18 claims and decide whether there is a missing element or  
19 not.

10:08AM 20 And I'm not going to try to minimize that  
21 because it's complicated, and here's the claim, the '167  
22 Patent claim. And there were a lot of it technical  
23 terms in here, but we're going to take you through it  
24 and the witnesses are going help you through it, but the  
10:08AM 25 reality is, it really comes down to this.

1 And Mr. Hueston said, "Well, we're not  
2 really disputing some of these other elements." I don't  
3 know if that's quite true, but the point is we're going  
4 to focus on the things that we can most directly point  
10:09AM 5 out to you are missing, and that is a layer of metal  
6 oxide and a distinct layer of oxide in the  
7 semiconductor. That "distinct" came from his Honor's  
8 construction of that patent.

9 So before I move on, let me make one more  
10:09AM 10 point. What the evidence is going to tell you about  
11 these products -- remember, they are made in a wafer,  
12 and there are billions and billions of these transistors  
13 on one little chip, and then there's hundreds of, or  
14 maybe even thousands of chips on a wafer. And these  
10:09AM 15 transistors are right next to each other; they are  
16 separated by just a few, you know, millionths of an  
17 inch, less than a millionth of an inch. And what do we  
18 know about electrical devices?

19 Well, you know, when you go to plug in your  
10:09AM 20 toaster in the morning, if that cord isn't encased in  
21 plastic, that's a bad morning, right? You want that  
22 plastic to keep you protected from that electricity.  
23 The same is true with these devices.

24 An oxide, silicon oxide in particular, is the  
10:10AM 25 one that they use to isolate, to separate these so that

1 the electricity doesn't flow between devices, which you  
2 don't want to have happen.

3 So you are going to see other parts of the  
4 device that have silicon oxide in it. They put it in  
10:10AM 5 there on purpose; they can tell you all about it.  
6 Importantly, thought, it's not where we're going to  
7 focus, which is this interface, right where that metal  
8 bar meets the semiconductor, the contact between the  
9 metal and the semiconductor.

10:10AM 10 And what the evidence is going to show here,  
11 ladies and gentlemen, is there are no layers.  
12 Mr. Hueston showed you a bunch of photographs, and then  
13 they had some color that they put in there. That wasn't  
14 in the photographs, because the reality is, what you are  
10:10AM 15 going to see is that that interface, that place where  
16 the metal meets the semiconductor is made of that  
17 silicide, not of an oxide.

18 So now let's talk a little bit about how these  
19 products are made, because these -- as I said, these are  
10:11AM 20 some of the most sophisticated things in human history.  
21 What I've got on Slide 14 is a photograph of the actual  
22 production line at the semiconductor Austin facility,  
23 the Texas facility. And you can see the guys in little  
24 bunny suits in there. It's an absolute clean  
10:11AM 25 environment. They've got to control vibrations. They

1 have got to do all kinds of things in order to make  
2 these things.

3 But these machines you see in front of you take  
4 these wafers that start out as just plain silicon and  
10:11AM 5 they end up as the most advanced and sophisticated  
6 microprocessors that we have, and they do them step by  
7 step. It takes three full months to make a lot of these  
8 products, and they go from machine to machine to machine  
9 and process after process after process.

10:11AM 10 So as you would expect, this is not some  
11 random. You can't just, "Oh, you know, Joe didn't show  
12 up this morning, so let's just have somebody else fill  
13 in for him," because these are the most sophisticated  
14 processes you will ever see. Everything has to be  
10:11AM 15 absolutely precise or it just doesn't work.

16 So what I've got up on Slide 15 is one of what  
17 we call the process flows, or some people call them  
18 recipe cards, but they are really process flows, because  
19 in each of these steps, there are sometimes further  
10:12AM 20 recipes. And what it does is it tells the technicians  
21 and the engineers exactly what they have to do in every  
22 step along the process, and there are 2,169 of them in  
23 this particular product.

24 And, ladies and gentlemen, those are not  
10:12AM 25 random. Those can't be the kind of thing that you just



1 do -- you just do differently on a Tuesday and on a  
2 Thursday. Everything is preordained. It absolutely has  
3 to be done precisely, and then they double-check it to  
4 make sure that it was.

10:12AM

5 And I apologize. I had to kind of gray these  
6 out because these are super, super secret, and we don't  
7 want to close the courtroom. We'll show them to you  
8 without the graying when the witnesses -- when

10:12AM

9 Dr. Raifsnider takes the stand, for example, you'll see  
10 them -- you'll see them in all their glory.

11 Now, remember, we're only focused on one little  
12 part of the chip, right where that metal meets the  
13 semiconductor. So those are the steps we're going to  
14 spend most of our time on, but I don't want to leave the  
15 point that there are over 2,000 of these. And of the  
16 steps that are required to make these chips, we're going  
17 to focus on about 20 of them, because that's where we  
18 get the metal meeting the contact.

10:13AM

19 And Dr. Raifsnider and then later our expert,  
20 Dr. Bokor who I'll introduce to you in a few minutes,  
21 are going to take you through every single one of those  
22 steps and show you how they build this mushroom cap,  
23 this epi S/D thing that's labeled on the slide. That's  
24 the silicon part. They build it up and they make it  
25 bigger. They make it bigger because they want the

10:13AM

1 contact resistance to be better. They want the current  
2 to flow more easily, so they make that bigger, that  
3 mushroom cap, epi S/D, short for epitaxial; but  
4 basically, it's just a mushroom cap. It's made out of  
5 silicon, and they make it bigger. You are going to get  
6 specific steps on what they do in order to create that  
7 in just the right place.

8 But I also want to describe for you step  
9 1,169, and I kind of unmask a little bit of that,  
10 because that's going to be a really important step.  
11 What happens in that step?

12 Well, after they make this mushroom cap, and  
13 that -- just to orient everybody, the space above it is  
14 empty, right? That white space is just empty, and the  
15 sides are some of that isolation that I talked about  
16 earlier. Above that epi S/D is just open space, and the  
17 surface of that epi S/D, that mushroom cap, is exposed.

18 So what does Samsung do? Well, Samsung knows  
19 that anytime you have an exposed surface like that,  
20 oxygen from the air might get in there and might cause a  
21 reaction, might create a little bit of oxide. Not much,  
22 but a little bit. But Samsung says, "We're not going to  
23 have that."

24 And so in this Step 1,169, what they do  
25 is they take the wafer and they put it in this thing

1 called a cluster tool, which is about the size of the  
2 well between me and all of you, and they close the  
3 chamber up and then they use these really, really strong  
4 pumps to take all of the air out, all of it. It's like  
10:15AM 5 being out in outer space. So the wafers are in a pure  
6 vacuum. And they take these wafers and then they put in  
7 this cleaner, which is called the SiConi cleaning  
8 process you are going to hear about. It's an  
9 ammonia-based cleaner, and its job is to go in, and if  
10:15AM 10 there's any oxide on the surface of this mushroom cap,  
11 it eats it and it vaporizes it and it's pumped out of  
12 there.

13 So they make sure that it is pristine,  
14 absolutely clean and precise, in this vacuum chamber.  
10:15AM 15 And then while it's still in this vacuum chamber, ladies  
16 and gentlemen, they put down a layer of titanium, a  
17 layer of metal, and then they put down a layer of  
18 titanium nitride. And I apologize about the chemistry,  
19 but titanium is the pure metal that they use to make the  
10:15AM 20 silicide. Remember, it combines with the semiconductor.  
21 And then the titanium nitride is like a sealant. It  
22 seals that entire surface.

23 So what you end up with is the yellow, which is  
24 the titanium nitride and over the titanium silicide. So  
10:16AM 25 there's no way any oxide can grow back. And then they

1 take it out of the vacuum chamber. So only after it's  
2 completely sealed do they take it out of the vacuum  
3 chamber.

4 And what I show here on the right is they  
10:16AM 5 actually put a piece of tungsten. Tungsten plug goes in  
6 on top. That's that metal bar ultimately that creates  
7 the contact. But the yellow is that titanium nitride,  
8 which is also a metal, and that titanium silicide is  
9 actually also a metal.

10:16AM 10 The point here is that there's no oxide. There  
11 certainly aren't two layers of oxide, which is what  
12 these patents require.

13 So let me set this up, if I can. Remember what  
14 Samsung does is this epi process, and this epi process  
10:17AM 15 creates a bigger mushroom cap. They make sure that it's  
16 really conductive. They dope it and they make that  
17 mushroom cap, and then they put a silicide layer on top  
18 of it, and that is known in the business as, "Epi plus  
19 silicide." People talk about that.

10:17AM 20 What I've got up on Slide 18 is an e-mail from  
21 one of the Acorn executives, a fellow by the name of  
22 Mr. Clifton. And you are going to see his testimony.  
23 His Honor talked about seeing some testimony by  
24 deposition. You are going to see Mr. Clifton's  
10:17AM 25 deposition.

1 And what Mr. Clifton did is he was having a  
2 meeting with a guy who was sort of like the Snap-On  
3 salesman for this business, or the Craftsman salesman.  
4 If you buy tools to make all those tools we saw in  
10:17AM 5 Mr. Raifsnider's production line, most of them come from  
6 a company called Applied Materials. He's working all  
7 the businesses, and he knows all the big players, and  
8 Mr. Clifton had a meeting with him, and he was very  
9 disappointed coming out of that meeting.

10:18AM 10 Mr. Clifton said, "You know, it doesn't look  
11 like our invention is going to go anywhere." He calls  
12 it the MIS contact, and that stands for  
13 metal-insulator-semiconductor, the thing that  
14 Mr. Hueston described.

10:18AM 15 He said, "You know, our invention's probably  
16 not going to go anywhere because epi and silicide is  
17 being used by everybody else, and it works too well.  
18 It's too successful," he says. And he talks about the  
19 idea that it's been so advanced and so successfully

10:18AM 20 applied that, "We just can't compete anymore." And  
21 that's right, because there were two different pathways.  
22 The pathway was the Acorn way, which was to use this  
23 metal-insulator-semiconductor, or MIS, or the way people  
24 like Samsung did it, which was metal silicide and then  
10:18AM 25 epi.

1 THE COURT: Five minutes remaining.

2 MR. CORDELL: Thank you.

3 You're going to hear a lot about that. And  
4 then the CEO, Mr. Horgan, writes back and says, "You  
10:19AM 5 know, let's not put anything else in writing about  
6 this," and we think you can probably understand why.

7 So let me move along here, because I am running  
8 short on time, but we could stop right here, ladies and  
9 gentlemen. We could stop with these process flows

10:19AM 10 because they tell you exactly how the product is made.

11 We don't have to guess. We don't have to think. We  
12 don't have to go off and deduce anything. We can look  
13 under the hood. We built the engine. We know how big  
14 the pistons are. We don't need to second-guess it, and  
10:19AM 15 that's the primary evidence that everybody should be  
16 pointing to.

17 But in this case, both sides, both experts,  
18 have taken the parts and sliced them up and given them  
19 to a company called EAG, Evans Analytical Group, who are  
10:19AM 20 the gold standard in this business, and they have done  
21 analysis using that microscope that Mr. Hueston showed  
22 you. Both sides did it. Both sides' experts did it.

23 And what I've got on Slide 30 is important  
24 because it shows you kind of the way the elements lay  
10:20AM 25 out in the chip. And just to put a fine point on it,

1 I've drawn a "50 percent" stripe across the middle of  
2 this. Why did I do that?

3 Well, turns out, in nature, oxygen, it floats  
4 around. We find it all over the place; but if it's  
10:20AM 5 going to form an oxide, that means you need at least one  
6 oxygen for every silicon, for example. If you're  
7 familiar with H<sub>2</sub>O, that's two hydrogens for one oxygen.  
8 Well, silicon oxide is one silicon, and one oxygen,  
9 which means if we're looking at the percentages here, we  
10:20AM 10 should see 50 percent oxygen.

11 And Dr. Bokor is going to take you through  
12 this, so I'm not going to belabor it. But, ladies and  
13 gentlemen, they're going to show you all these plots.  
14 They're going to show you squiggly line after squiggly  
10:20AM 15 line, and you're never going to see where the oxygen  
16 gets up to 50 percent. You'll see some down in the  
17 bottom, because there's oxygen everywhere and there's  
18 always a little bit of it hanging around, but you are  
19 never going to see it enough to make an oxide.

10:21AM 20 And I'm going to -- Dr. Bokor is going to take  
21 you through this a step at a time, and he's going to  
22 show you how they scan through the part and you can  
23 report out exactly what levels of each of the elements  
24 there are, and you can see them listed on the right in  
10:21AM 25 the different colors, but he's going to take you through

1 that.

2 The important thing is this oxygen curve, this  
3 pink part at the bottom never comes close to 50 percent,  
4 which is what you need for an oxide.

10:21AM

5 Now, EAG's expert, Dr. Piner, who you were  
6 introduced to, he also -- I said, "EAG's expert." I  
7 meant Acorn's expert. Dr. Piner went to EAG as well.  
8 They both used the same lab, and this is one of his  
9 curves. And you can see the oxygen, ladies and

10:21AM

10 gentlemen, is way down at the bottom. It's in green.  
11 You can barely see it. It's just sort of background  
12 oxygen at that level.

13 But, ladies and gentlemen, he also did  
14 something else. One of the charts that Mr. Hueston  
15 showed you showed that, you know, the data had sort of  
16 been manipulated. I don't know what word to use for  
17 this. Because Dr. Piner got this chart, and apparently  
18 he wasn't happy with it; so what he did is he changed  
19 that oxygen by multiplying it by 15. And, look, these  
20 are very complicated cases. We have to trust these  
21 experts. We really put a lot of faith in what they do,  
22 and I'm going to look forward to his explanation as to  
23 why he felt like he should do that, because what it did  
24 is it made this oxygen curve, this red or orange curve,  
25 look bigger and come up close to where the silicon is,

10:22AM



1 so it almost looked like it was 50/50.

2 But I'm going to leave it to them to explain  
3 why they felt like that was appropriate. And, again,  
4 ladies and gentlemen, the process flow is the real  
10:22AM 5 evidence. That's what we should be focused on, and they  
6 are not going to show you a single step, not one, where  
7 a layer of oxide was created or a semiconductor oxide  
8 and a layer of metal oxide. They can't show it because  
9 it's not there, and that should be the real focus of  
10:23AM 10 this case.

11 So quickly, let me go through just a little bit  
12 of the timeline. We heard a lot from Mr. Hueston about  
13 papers and citations, and you heard from your Honor  
14 that -- his Honor that people prosecute patents and they  
10:23AM 15 cite lots of other patents while they are doing that.  
16 It's all what the patent lawyers do. And that did  
17 happen in this case; but importantly, what also happened  
18 is that Samsung, completely on its own, without knowing  
19 anything about Acorn, began their design for this  
10:23AM 20 process back in 2011.

21 They built out a factory in 2014, long before  
22 Acorn got its patents. You can see the first patent --

23 THE COURT: Mr. Cordell, your time's expired.  
24 Take a few seconds and finish up.

10:23AM 25 MR. CORDELL: Thank you, your Honor. May I

1 introduce my witnesses?

2 THE COURT: You may.

3 MR. CORDELL: Thank you. Ladies and gentlemen,  
4 I'd like to introduce you to Dr. Bokor, who is going to  
10:23AM 5 be our technical expert. He is from -- he's got degrees  
6 from MIT and Stanford. Apparently he couldn't get into  
7 LSU, but he's a professor at Berkeley now.

8 We have Mr. Meyer, who is our financial expert,  
9 who is going to help us respond to some of the damages  
10:24AM 10 claims that have been made by Acorn.

11 We have Mr. Chi Won Cho, who is one of the  
12 engineers from Samsung who is going to testify about  
13 some of his processes. Dr. Hong Lae Park did a study to  
14 look at oxide and decided that it wasn't really  
10:24AM 15 appropriate; it didn't work in Samsung's trials.

16 So with that, ladies and gentlemen, I'll thank  
17 you for your time and attention, and I look forward to  
18 putting on the rest of the case.

19 THE COURT: Counsel, does either party wish to  
10:24AM 20 invoke the Rule?

21 MR. DIXON: Yes, your Honor. Acorn invokes the  
22 Rule.

23 THE COURT: And I take it that that would  
24 exclude application of the Rule to the expert witnesses?

10:24AM 25 MR. DIXON: Yes, your Honor. Both corporate

1 representatives.

2 THE COURT: All right. The Rule has been  
3 invoked excluding expert witnesses and, by definition,  
4 corporate representatives are excluded. That means if  
10:25AM 5 you are a fact witness in this case, you will have to  
6 remain outside the courtroom until you are called to  
7 present testimony. Expert witnesses and corporate  
8 representatives are excluded and they remain in the  
9 courtroom.

10:25AM 10 Ladies and gentlemen, we're going to take a  
11 brief recess, and when we come back, Plaintiff will call  
12 their first witness. Please just simply close your  
13 notebooks and leave them there in your chairs. Follow  
14 all the instructions I have given you, and we'll be back  
10:25AM 15 shortly to continue, and we'll start with the  
16 Plaintiff's case-in-chief and Plaintiff's first witness.  
17 The jury is excused for recess.

18 (Whereupon, the jurors exit the courtroom.)

19 THE COURT: Court stands in recess.

10:26AM 20 (Recess from 10:26 a.m. to 10:45 a.m.)

21 THE COURT: Counsel, during jury selection, I  
22 limited counsel to three at counsel table. I'm happy  
23 with there being four people at each counsel table  
24 during the trial, all right?

10:45AM 25 Plaintiff, are you prepared to call your first

1 witness?

2 MR. DIXON: We are, your Honor. Plaintiff will  
3 call Dr. Dan Grupp.

10:45AM

4 THE COURT: Let me get the jury in, and we'll  
5 do that on the record.

6 MR. DIXON: Okay.

7 THE COURT: If you'll bring the jury in,  
8 please.

9 (Whereupon, the jurors enter the courtroom.)

10:46AM

10 THE COURT: Please be seated.

11 Plaintiff, call your first witness.

12 MR. DIXON: Thank you, your Honor. Acorn calls  
13 Dr. Dan Grupp --

14 THE COURT: All right.

10:46AM

15 MR. DIXON: -- to be examined by Mr. Hueston.

16 THE COURT: If you'll come forward and be  
17 sworn, please. Come around, please. Raise your right  
18 hand to be sworn.

19 (Whereupon, the witness was duly sworn.)

10:46AM

20 THE COURT: All right. Now, if you'll come  
21 around and have a seat at the witness stand, sir.

22 THE WITNESS: Thank you.

23 THE COURT: All right. Counsel, you may  
24 proceed with direct examination.

10:47AM

25 MR. HUESTON: Thank you, your Honor.

1 DANIEL GRUPP,  
2 having been first duly sworn, testified as follows:

3 DIRECT EXAMINATION

4 BY MR. HUESTON:

10:47AM 5 Q. Good morning, Dr. Grupp.

6 A. Good morning.

7 Q. Could you please state your full name for the  
8 record.

9 A. Dr. Daniel Grupp.

10:47AM 10 Q. Now, I would like to start by asking you a couple  
11 questions about your educational background. Have you  
12 earned any professional degrees?

13 A. Yes, I have.

14 Q. And where did you get those?

10:47AM 15 A. My undergraduate degree is from -- physics is from  
16 Cornell and my Ph.D. is from University of Pennsylvania.

17 Q. All right. And what is your understanding as to why  
18 you are here testifying today?

19 A. Because I'm the inventor of the technology in  
10:47AM 20 question.

21 Q. All right. And for which company were you working  
22 when you invented that technology?

23 A. Acorn Technologies.

24 Q. And how long did you work at Acorn?

10:48AM 25 A. About five years.

1 Q. And do you have any relationship with Acorn  
2 currently?

3 A. Yes, I do.

4 Q. And what is the nature of that relationship?

10:48AM

5 A. I'm a consultant and I have a minuscule amount of  
6 stock in the company.

7 Q. All right. Can you briefly describe your employment  
8 history after you left Acorn in 2005.

10:48AM

9 A. Sure. So I worked for a number of medical device  
10 and semiconductor and solar companies.

11 Q. All right. And I'll get into a couple those  
12 examples in a moment, but is there a common thread in  
13 your employment over the last 25 years?

10:48AM

14 A. Yes. They were all at the leading edge of  
15 innovation and invention.

16 Q. And let me ask you, when did you start inventing?

10:49AM

17 A. Well, as long as I can remember, I've been an  
18 inventor. I remember being in a car when I was 5 years  
19 old and my sister would ask me a question and I would  
20 say, "Don't talk to me. I'm inventing."

21 Q. And can you remember the first time that you thought  
22 about trying to fix something as a kid and what you did  
23 there?

10:49AM

24 A. Yeah. So I've always done that. And my father  
25 bought me those old adding machines with a crank on it,

1 and he got it for -- I remember he told me he got it for  
2 a dollar from the old television repair store. And I  
3 sat there for years taking it apart and tinkering with  
4 and seeing how all the insides of this thing worked.

10:49AM

5 Q. Now, you mention you're married. Do you also have  
6 children?

7 A. Yes, I do. I have two sons.

8 Q. And how old are they?

9 A. 9 and 11.

10:49AM

10 Q. And are they inventors?

11 A. They are inventors in their own right. They  
12 invented a toy called a straw blaster that they  
13 discovered in the kitchen, that you could actually  
14 launch a straw out of a cardboard tube, and I said,  
15 "That's amazing; we have to make this into a product."  
16 And I helped them develop a whole little toy out of it  
17 with a handle and everything, and we actually sold them  
18 at the local toy store, and we sold out. We sold a  
19 couple dozen.

10:49AM

10:50AM

20 Q. What do you like about inventing?

21 A. What I love about it is it's very exciting. It's  
22 like exploring and I'm going into an unknown realm and  
23 discovering something, and that's the place I like to  
24 live, in the unknown. It's like going across the ocean  
25 when you've never seen what's across the ocean and you

10:50AM

1 get to discover a whole new continent.

2 Q. And have you been inspired by any particular  
3 inventor?

4 A. My favorites are really the Wright Brothers.

10:50AM 5 Q. Now, the Wright Brothers who invented the airplane?

6 A. Yes, that's right.

7 Q. And why is -- why are the Wright Brothers your  
8 favorite?

9 A. Well, they took on this problem of flight and they  
10:50AM 10 solved it in a couple years with just really sticks and  
11 pieces of cloth and glue, stuff that had been around for  
12 hundreds of years, just these two guys together in a  
13 bicycle shop really just figured out how to do it right  
14 and how to get through this complete unknown with really  
10:51AM 15 simple things, and they solved a problem that people  
16 have spent millions of dollars in today's dollars and,  
17 like, Langley, head of Smithsonian, he spent a million  
18 dollars and he launched an airplane that crashed  
19 straight into the Potomac with great fanfare, and these  
10:51AM 20 guys, for something like tens of thousands of dollars in  
21 today's dollars, overturned the whole world.

22 Q. In your view, is inventing new technology easy?

23 A. No. It's really hard.

24 Q. Why is that?

10:51AM 25 A. I'd say at the heart of it is that Mother Nature is



1 just really tough. She's just not going to give up her  
2 answers easily.

3 Q. And does it involve trial and error?

4 A. A lot of trial and error.

10:51AM

5 Q. Now, in your career, have you focused your inventing  
6 on any particular areas or industries?

7 A. Really on two: Semiconductors and medical devices.

8 Q. Okay. Let's talk about a few of these inventions.

9 Let me ask you about the medical devices that you just

10:52AM

10 referenced. What's the first medical device you  
11 invented after leaving Acorn?

12 A. The first one was a method for doing prostate  
13 surgery that had no risk of nerve damage. It just uses  
14 cold water, whereas the previous technology uses a hot  
15 water with a high risk of nerve damage, with some very  
16 unwanted, life-changing consequences, and our technique  
17 had no chance of this, and it's now, thankfully,  
18 available in the U.S.

10:52AM

19 Q. And what is the next medical technology you  
20 developed?

10:52AM

21 A. Then I worked for -- I built a device from the  
22 ground up that has a chance to save millions of kids'  
23 lives. It's now for sale in India. It just recently  
24 went on the market, and it's the world's fastest,  
25 cheapest, portable, most sensitive malaria diagnostic.

10:52AM

1 Q. And where do you work currently?

2 A. At my own start-up company called LifeAir.

3 Q. And have you invented any technology at your  
4 start-up?

10:53AM 5 A. Yes, I did.

6 Q. What was that?

7 A. So it's a new kind of ventilator. What we  
8 discovered, what I discovered when I started to look at  
9 in the beginning of the pandemic to see how I could  
10:53AM 10 help, because I was building medical devices; there's a  
11 lot that needed to be done, and I discovered this major  
12 design flaw.

13 But it turns out that using a ventilator  
14 after someone else has used it is like -- someone sick  
10:53AM 15 has used it is like sharing someone's mask. And it  
16 turns out that ventilators are never cleaned inside;  
17 and, in fact, you can't do it, and it's never done, and  
18 I thought this just has to change.

19 So I invented a way to clean it and change all  
10:53AM 20 the parts in under a minute. It was clean and fresh,  
21 and you're good to go.

22 Q. All right. Now, we're going to be talking about  
23 patents in this case. Do you have any patents,  
24 Dr. Grupp?

10:54AM 25 A. Yes, I do. I have 37 issued patents and another

1 handful that are on file.

2 Q. All right. I now want to talk with you about your  
3 time at Acorn and the technology you invented there, but  
4 first let me ask you: How did you come to join Acorn?

10:54AM 5 A. I was at the University of Minnesota after my Ph.D.  
6 doing some research, and I invented a type of  
7 transistor. And then I was introduced to  
8 Professor Jim Harris at Stanford, and he said, "Come on  
9 out and join my group and get going on this, it's a  
10:54AM 10 great idea." And then shortly after that, I was  
11 introduced to Acorn.

12 Q. What kind of company is Acorn?

13 A. So Acorn is, you might call it an incubator.

14 Q. What does that mean?

10:54AM 15 A. So what they do is they take inventions or  
16 technology from universities that are kind of young  
17 sprouts, and industries get really interested in things  
18 that are that young, really have been developed, and  
19 they fill that gap. They help them grow to the point  
10:55AM 20 where industry would like to invest in them.

21 Q. Great. And why did you want to join Acorn?

22 A. Well, that's exactly where I was. My transistor I  
23 invented at the time was just on paper, and it really  
24 wasn't ready, and I thought they are just great guys. I  
10:55AM 25 remember after our first meeting, we were talking,

1 saying, "These guys are just A players, and I think they  
2 can make us fly."

3 Q. When did you start working at Acorn?

4 A. That would be at the spring of 2000.

10:55AM 5 Q. And what were your job responsibilities?

6 A. My job responsibility was to develop this new  
7 device.

8 Q. And did you work with any other inventor there?

9 A. Yes, I did. Dr. Daniel Connelly in particular.

10:55AM 10 Q. And how would you describe Dr. Connelly?

11 A. Well, he's one of the most amazing people that  
12 you'll ever meet. I think he's the smartest person that  
13 I've ever met on the planet, and --

14 Q. Can you give an example of how you thought of that?

10:56AM 15 A. There was this amazing thing he could do with his  
16 incredible memory, that at the end of the meeting, I  
17 would say, "Dan, summary?" Now, look. Me, after a  
18 three-hour meeting, you say, "What did you talk about?"  
19 I'd say, "Well, we talked about a lot of good stuff and  
10:56AM 20 made some good points." And you'd ask Dan, and he would  
21 just read out this outline that he had in his head of  
22 everything we talked about. He said, "First we talked  
23 about this and then we talked about this and we talked  
24 about this. Now, under those three things, first, there  
10:56AM 25 were these three things."

1 And everyone would sit in the room with  
2 their jaws dropped and open. This is, like, something  
3 that none of us could ever imagine doing.

4 THE COURT: All right. Dr. Grupp, I'm going to  
10:56AM 5 ask you to not refer to anybody by first name only.

6 THE WITNESS: Oh. Sorry, Judge.

7 THE COURT: If you'll refer to "Dr. Connelly"  
8 or "Dan Connelly." You and he have the same first name,  
9 so let's just not use first names only. All right?

10:56AM 10 THE WITNESS: My apologies. I will be --

11 THE COURT: All right. Let's continue.

12 MR. HUESTON: Thank you, your Honor.

13 Q. At a very high level -- and, by the way, Dr. Grupp,  
14 I even mixed up the names in the opening and said it was  
10:57AM 15 going to be Dr. Connelly, and it's yourself. So let's  
16 keep it to last names.

17 A. My apologies. We used to have fun with that, the  
18 two Dans. I'm sorry.

19 Q. All right. At a very high level, can you describe  
10:57AM 20 the technology that you and Dr. Connelly invented?

21 A. Yeah. So at the highest level, it's a way to get  
22 electricity to flow easier from a metal into a  
23 semiconductor.

24 Q. Now, why does that matter, on an everyday level, for  
10:57AM 25 me and people in this courtroom?

1 A. Sure. So if you can't get electricity to flow, then  
2 -- let me say it the other way. You want electricity to  
3 flow so that things like your battery lasts longer and  
4 so that things like your cell phone can think faster and  
10:57AM 5 compute faster and do all these tricks we want, like  
6 face recognition and voice recognition. It takes a lot  
7 of computing power.

8 And if it's going -- it can't get  
9 electricity through, then everything slows down.

10:58AM 10 Q. When did you invent this technology?

11 A. In spring of 2001.

12 Q. And what work were you doing leading up to this  
13 invention?

14 A. Well, I had started at Acorn with another type of  
10:58AM 15 transistor.

16 Q. And the jury's begun to hear about transistors, but  
17 maybe you can start with, if you can, a simple  
18 explanation of what a transistor is.

19 A. So real simple, what they do, in your phone or in  
10:58AM 20 your computer, is they are just switches. That's all  
21 they are, nothing more than that. The electricity's  
22 coming in, and you've got another wire actually attached  
23 to your switch, and you can turn it on and off.

24 Q. And by the way, how small are those switches?

10:58AM 25 A. They are really, really small. Right now, the one

1 you have in your pocket, you can write about a million  
2 transistors on the end of a hair.

3 Q. Now, you said you were working on a new transistor  
4 structure. Did you encounter any particular challenges  
10:59AM 5 when you were working on that?

6 A. Yes, I did.

7 Q. And what was that challenge?

8 A. So I came up against this problem that I have to say  
9 I don't feel too bad about, because Acorn had been  
10:59AM 10 tasked by a professor from Harvard and a professor from  
11 Berkeley, and they hadn't caught it either, so not too  
12 embarrassed about it.

13 But we came up against this problem called  
14 the Schottky barrier that I hadn't realized would show  
10:59AM 15 up in my device.

16 Q. Okay. And before I ask you to provide a technical  
17 definition of what you just called "the Schottky  
18 barrier," would it help you explain this by showing  
19 slides that you've prepared?

10:59AM 20 A. Yes, that would be great.

21 MR. HUESTON: All right. With the Court's  
22 permission, I'd like to show Grupp Demonstrative  
23 Number 1.

24 THE COURT: Proceed.

10:59AM 25 Q. So, Dr. Grupp, explain this first slide here.

1 A. Okay. So what we're seeing here is I'm going to  
2 make an analogy between metal and a semiconductor  
3 contact by imagining the metal is a road and the  
4 semiconductor, the silicon, as a bridge.

11:00AM

5 When you bring these two together, you'd like  
6 electricity to flow across. So here we have, on the  
7 left side, we've got a metal, and that's a roadway, and  
8 imagine that electricity is like a car that you want to  
9 flow. Let's say the electricity is something that

11:00AM

10 flows, so we imagine this is a car.

11 And when you -- if this is an ideal situation,  
12 you'd like to bring the metal into contact, and the  
13 roadway of the metal lines up with the roadway of the  
14 bridge, and the electricity or the cars will go right  
15 across.

11:00AM

16 Q. Just like that?

17 A. Just like that.

18 Q. All right. So that's the ideal thing that you want?

19 A. Right.

11:00AM

20 Q. That they can just go slide right across the metal  
21 over to that silicon?

22 A. That's correct.

23 Q. On a smooth road; is that right?

24 A. Yes, sir, that's correct.

11:00AM

25 Q. All right. Do you have a next slide to show what



1 the issue really is inside?

2 A. Yes, please.

3 Q. Let's go to the next slide.

4 A. So --

11:01AM 5 Q. What is this?

6 A. So what actually happens is that when the metal  
7 touches the silicon, that it actually ends up below the  
8 roadway, below the beginning of the bridge. And the  
9 cars just run into this wall and can't get across, and

11:01AM 10 that's called the Schottky barrier.

11 Q. That wall right there?

12 A. That wall right there. They are just stuck.

13 Electricity can't get across, ran into the Schottky  
14 barrier.

11:01AM 15 Q. Okay. Let's take these slides down. Thank you for  
16 that illustration.

17 A. I'd like to add that the goal is to get back to the  
18 ideal case.

19 Q. The "goal" there meaning the bridge?

11:01AM 20 A. Yeah. And to that point, you couldn't do it. It's  
21 just stuck down there; and we wanted to get it -- the  
22 road matching up with the bridge so electricity would  
23 just flow across.

24 THE COURT: Let me interject. We need to do  
11:01AM 25 this direct examination with questions from counsel and

1 answers from the witnesses, not a dialogue, not a  
2 conversation. Discrete questions and direct answers  
3 limited to those questions.

4 So let's go forward on that basis.

11:02AM

5 MR. HUESTON: Thank you, your Honor.

6 THE WITNESS: Thank you, Judge.

7 Q. And is there another name to describe something that  
8 hinders the flow of electricity in a transistor?

9 A. Yes. That would be called resistance.

11:02AM

10 Q. Okay. And let me ask you: What happens when  
11 resistance is too high?

12 A. When resistance is too high, electricity can't flow.

13 Q. And when resistance is high, does something happen  
14 like heating up in devices?

11:02AM

15 A. So what happens is resistance is too high, the  
16 device either slows down or you can drive -- try and  
17 drive the cars faster, but then everything begins to get  
18 hot, and you can actually burn out your computer.

19 It's kind of like when -- you could make a car  
20 go faster, you could put the pedal all the way down, put  
21 the pedal to the metal, but then you are risking burning  
22 out your transmission.

11:02AM

23 Q. Okay. So I want to focus back on the Schottky  
24 barrier. Was there a known solution around the Schottky  
25 barrier back when you were looking at it in 2001?

11:03AM

1 A. No, there was no solution. It was just accepted  
2 that this is the way things are, that the Schottky  
3 barrier's stuck there.

11:03AM

4 Q. All right. So what did you do when you discovered  
5 this barrier, the Schottky barrier?

6 A. Well, I said, "I have to fix this because I've got a  
7 whole project. I've got people working for me. I've  
8 got a whole project/company on the line, and I'm going  
9 to make this work."

11:03AM

10 And so I went to the library and just read  
11 everything I could. I didn't accept that that is just  
12 the way it is, but I said, "I've got to find out is this  
13 a law of nature or is there some way around it."

11:03AM

14 Q. And so then what happened after you tried to read  
15 everything you could on this and to dig in?

16 A. So after I really understood everything there was to  
17 understand, there was a moment when I'm sitting in the  
18 library and I put it all together. I remember the light  
19 coming in from this big window in the library and this  
20 moment when I said, "I think I know how to solve this."

11:04AM

21 Q. And what was that idea that came to you?

22 A. So what everyone had been doing was trying to  
23 squeeze the two together, trying to get that metal  
24 really tightly up to the semiconductor; and the insight  
25 I had was that there's a range where, if you actually

11:04AM

1 separate them by a very small amount that the current  
2 should actually flow faster," and it's completely  
3 opposite to what everybody thought at this point and  
4 nobody had tried that. It was an unknown realm.

11:04AM

5 Q. And so how was this a new idea?

6 A. So it's a new idea because what people had been  
7 trying was to get them closer, and what I said was,  
8 "Actually, what you want to do is pull them apart a  
9 little bit."

11:04AM

10 Q. And did you have a thought about an insulation  
11 layer?

12 A. Yes. So the idea, how would you pull them apart,  
13 the idea is that you put in a layer of insulator,  
14 something that doesn't let electricity flow, but in this  
15 special case that it actually would let a little bit of  
16 electricity flow. It's very, very thin. You put an  
17 insulator in between the metal and the semiconductor.

11:05AM

18 Q. All right. And can you think of an analogy for the  
19 jury that would help illustrate why this was really a  
20 new and different idea that others weren't thinking of?

11:05AM

21 A. Yeah. So the technical language for this, for the  
22 description of what happens would be that the electron's  
23 wave of -- the electrons reaches into the gap of the  
24 semiconductor and induces states called metal-induced  
25 gap states at the interface, and the metal, the

11:05AM

1 semiconductor to maintain a charge of neutrality; it  
2 creates a surface states, the virtual crossing point of  
3 the band. That's what the scientist would say.

4 Q. All right. But let me stop you there. And that is  
11:06AM 5 a bit of a mouthful. Can you explain what you were just  
6 describing in everyday terms for me and the rest of the  
7 folks here?

8 A. Yes. So the way I actually think about it is this:  
9 That what happens is the metal, as you bring a metal up  
11:06AM 10 to a semiconductor that, think of the semiconductor  
11 having, like, this alligator sitting there with its  
12 mouth open, just sitting there. And you bring the  
13 semiconductor up to it, right, you bring the metal up to  
14 it.

11:06AM 15 The fingers, kind of like these fingers of the  
16 metal, they tickle the alligator when it gets real  
17 close, and the alligator wakes up and it snaps down on  
18 this, on the metal approaching, kind of like a mouse  
19 approaching, just grabs it and sticks it there. And --

11:06AM 20 Q. Let me just ask you there. So when that alligator  
21 snaps in and holds it there, what is that? What's the  
22 problem?

23 A. So that, that's actually creating this barrier.  
24 That's actually what's keeping that metal down below the  
11:07AM 25 roadway of the bridge.

1 Q. Okay. And so, again, on a simple level, how did  
2 your invention solve the issue of the alligator snapping  
3 in on the metal and creating the barrier?

4 A. So the key insight is that if you bring the metal up  
11:07AM 5 real close but not too close, don't wake up the  
6 alligator, that you could kind of fool the alligator,  
7 because if you come close enough, then it won't wake up  
8 and it doesn't snap down, and then the road that the  
9 cars or electrons can go from the metal, right across  
11:07AM 10 the roadway, to the bridge to the silicon.

11 And the key there is that there's a strange  
12 region where, if it's really thin and gets really close,  
13 the insulator doesn't look like an insulator anymore.  
14 That electricity can actually go through an insulator.

11:08AM 15 Right, I won't get into this, but this is the  
16 screening role of quantum mechanics, and it's really  
17 important here that when that insulator gets thin,  
18 doesn't look like an insulator and electricity can  
19 actually flow through, and you don't wake up to the  
11:08AM 20 alligator.

21 So the idea is to come close enough that  
22 electricity can flow but not too close that you wake up  
23 the alligator, and there's kind of this range in there  
24 where things should get a lot better.

11:08AM 25 Q. All right. And was there another aspect of the

1 Schottky barrier that your invention solved?

2 A. Yes. So there's -- not only is there an alligator,  
3 but the surface has these other states, and you can  
4 think of states kind of like static electricity that  
5 attracts something. And these other states would be  
6 called dangling bonds, and you've got to get rid of  
7 those.

8 So you've got to get rid of what's called  
9 the MIGS, or the alligator, and you've also got to get  
10 rid of these surface states called dangling bonds.

11 Q. And how did your invention get rid of those dangling  
12 bonds?

13 A. So if you add a layer that called passivates, it  
14 satisfies these dangling bonds, then you get rid of  
15 those as well.

16 Q. All right. So you have this idea, and what do you  
17 and Dr. Connelly do next?

18 A. So we immediately begin to try to prove that we are  
19 right, because this is an idea that's never been done  
20 and we want to show that it really works.

21 Q. And what kind of hours were you working at this  
22 point to try to get to a solution?

23 A. Well, it might be easier to try to answer how many  
24 hours wasn't I working at the time. I was working  
25 something like 15-hour days and weekends. I think I

1 gave myself a Saturday morning off until 1:00, and I was  
2 back in the lab.

3 Q. What kind of working relationship did you have with  
4 Dr. Connelly?

11:09AM

5 A. We had a -- Dr. Connelly and I had a great working  
6 relationship, where we could just talk for hours and  
7 dive deep into a subject from blackboard, and we never  
8 had any arguments. We just dove really to the heart of  
9 the matter, and I think we once had a six-hour meeting

11:10AM

10 at the Blackboard. And after that, I thought, that was  
11 amazing.

12 Q. And what kind of tests did you and Dr. Connelly do?

13 A. Well, there were several different kinds.

14 Q. Did you -- before we get into this, did you actually  
15 record the results of these tests?

11:10AM

16 A. Yes, we did.

17 Q. And what were you recording this in?

18 A. In notebooks.

19 Q. Are they called lab notebooks?

11:10AM

20 A. Lab notebooks, yes.

21 Q. All right. So let's put up PTX-9, which will appear  
22 on the screen, and I'll just ask you, looking at the  
23 cover here, Dr. Grupp, can you tell me what this is?

24 A. This is one of my lab notebooks. That's my  
25 handwriting.

11:10AM



1 Q. All right. And now we're going to turn to Page 64  
2 in this document here on the computer, and there's a  
3 graph here at the top of the page, and I want to ask  
4 you: What does this reflect?

11:11AM 5 A. These are the measurements we were doing on some  
6 devices that we're making examples of our invention.

7 Q. All right. And then I notice some writing there off  
8 to the right. Do you recognize the handwriting?

9 A. Yes. That's my handwriting.

11:11AM 10 Q. What does it say?

11 A. Says, "Dropping like a rock."

12 Q. And what did you mean when you wrote, "Dropping like  
13 a rock"?

14 A. What I mean is that we're changing this layer in  
11:11AM 15 between by a very small amount and that's making this  
16 huge change; and that huge change means that, in the  
17 analogy I'm using, that we haven't -- we've gotten  
18 really close and electricity's flowing and we've shown  
19 we can do it without waking up the alligator.

11:11AM 20 Q. And did you continue your testing?

21 A. Yes, certainly.

22 Q. Let's turn to Page 114 of your lab notebook, and  
23 we're at the page -- and I want to direct your attention  
24 to the top of the page. There's a graph there. Is this  
11:12AM 25 a printout?

1 A. Yes, this is a printout.

2 Q. And let me just ask you: Is it significant to you  
3 that this is a printout in your lab notebook?

4 A. Yes, it is.

11:12AM 5 Q. Why is that?

6 A. Because in those days, printers were not little,  
7 cheap desktop things; and that to print something out  
8 meant I had to go from the basement, where I did  
9 measurements, up and find a printer and print it out,

11:12AM 10 because I really wanted to stick it in my notebook. And  
11 so I only did that when I had something really worth  
12 recording.

13 Q. All right. And what level of contact resistance did  
14 you achieve here, as reflected in the printout?

11:12AM 15 A. So without -- as a direct measurement that this gets  
16 down to, a couple little microns squared.

17 Q. And was this of significance to you?

18 A. Yes, certainly.

19 Q. Why is that?

11:13AM 20 A. Because the ability -- the best context that anyone  
21 could make at the time was about 20 times worse than  
22 this. This is the best that anybody's ever seen.

23 Q. What was your reaction when you were able to record  
24 these results?

11:13AM 25 A. Well, it was really exciting because it had all just

1 been an idea, and we didn't know how good the idea was.  
2 So the graph before, where I said, "Dropping like a  
3 rock" showed, okay, it looks like -- it looks like we're  
4 correct; it looks like the underlying physics of how it  
11:13AM 5 works, the idea of it works, but how good is it going to  
6 be. And this is, I think, the first one where we  
7 showed, yeah, this really works well, that the effect is  
8 really profoundly huge, very important.

9 Q. All right. Again, on a practical level, why does a  
11:13AM 10 20-times reduction in contact resistance matter for  
11 everyday folks?

12 A. So again, it can make your battery last longer, it  
13 can make your computer run faster, your cell phone run  
14 faster, calculate more things, do more tricks; and it  
11:14AM 15 also keeps -- every year, the phones get faster and  
16 faster and computers get faster and faster, and it meant  
17 that we can keep going with that for years ahead.

18 Q. So you talked about how your invention addresses  
19 this issue of contact resistance. Has the importance of  
11:14AM 20 contact resistance changed over time?

21 A. No, it has -- but, yes, it has; that, in fact, it  
22 gets more important over time.

23 Q. And why is that?

24 A. Because there are two parts, really, to a  
11:14AM 25 transistor. One is the part you turn on and then

1 there's all the other parts that try and get the  
2 electricity to the switch. And those other parts are  
3 called parasitic resistances; and those, it's hard to  
4 get those smaller and smaller, and they end up being a  
5 bigger and bigger part of the problem.

11:14AM

6 Q. All right. So you described how you developed this  
7 new technology and you tested it. Did you do anything  
8 next to protect your invention?

9 A. Yes, we did.

11:15AM

10 Q. What did you do?

11 A. We wrote a patent.

12 Q. And why was it important to write a patent to  
13 protect your invention?

14 A. Because we wanted to establish that this is our  
15 technology and so we could own it and bring it to the  
16 world and have control over it.

11:15AM

17 Q. Now, you said you wrote a patent. Did you actually  
18 help write out the patent?

19 A. Yes, in fact, I did.

11:15AM

20 Q. And you mentioned earlier that you currently have 37  
21 patents and there are others pending. On all those  
22 other occasions, did you actually write out those  
23 patents?

24 A. No, I didn't.

11:15AM

25 Q. So why did you decide to write out this one?

1 A. Well, it was so new and so complex that -- and  
2 profound that we thought we really want to tell the  
3 world how this works, and the best people to do it would  
4 be Dr. Connelly and myself, the scientists and engineers  
11:16AM 5 that understood it and invented it.

6 Q. When do you recall drafting that patent application,  
7 approximately?

8 A. That would be in the fall of 2002.

9 Q. Okay. And then what happened with that patent  
11:16AM 10 application after it was filed?

11 A. Well, eventually the patent was allowed and issued.

12 Q. Do you remember roughly when that was?

13 A. 2006.

14 Q. Okay. And later did you file other patent  
11:16AM 15 applications relating to this invention?

16 A. Yes, we did.

17 MR. HUESTON: And at this time, your Honor,  
18 with the Court's permission, I'd like to pass out  
19 physical copies of the patents at issue.

11:16AM 20 THE COURT: Pass out to whom?

21 MR. HUESTON: To the witness. I'm sorry.

22 THE COURT: You can approach the court security  
23 officer; he will hand them to the witness.

24 MR. HUESTON: Thank you, your Honor.

11:17AM 25 Q. Dr. Grupp, I've handed you the physical copies of

1 the patents here. I'd like to talk to you first about  
2 the one at the top, the '336 Patent. Do you recognize  
3 that document?

4 A. Yes, I do.

11:17AM 5 Q. Is this one of the patents at issue in the case?

6 A. Yes, it is.

7 Q. And let me ask you about the next one in order  
8 there, which is PTX-2470, which is the '167 Patent, the  
9 written copy. Do you recognize that patent?

11:17AM 10 A. Yes, I do.

11 Q. And what is that?

12 A. This is another patent of my invention.

13 Q. All right. And let me ask you, then, about the  
14 other two there in your hands, PTX-1306 and 1308. Do  
11:18AM 15 you recognize those patents?

16 A. Yes.

17 Q. Are these your patents, sir?

18 A. Yes, these are my patents.

19 Q. And, Dr. Grupp, I want to ask you: How does it feel  
11:18AM 20 to hold those patents in your hand?

21 A. Well, it's admittedly very emotional that this is,  
22 you know, kind of what, you know, I dreamed about my  
23 whole life. I've never actually seen these. You just  
24 get a notice that you got them, but I've never seen the  
11:18AM 25 actual patent, and this is -- this is what I've dreamed

1 about from the time I was 5.

2 Q. Thank you, Dr. Grupp. Let me ask you -- you can put  
3 that aside for now. In addition to the patent  
4 application, did you try to publish to the world your  
5 technology in any other way?

6 A. Yes, we did.

7 Q. How did you do that?

8 A. We wrote papers that we submitted to journals.

9 Q. All right. Let me put up PTX-92. And there is  
10 PTX-92 on your screen, Dr. Grupp. Do you recognize this  
11 document?

12 A. Yes, I do.

13 Q. What is it?

14 A. This is our first paper that we wrote in 2004.

15 Q. When was this published?

16 A. In 2004.

17 Q. And let's look at the first sentence. It says, "A  
18 new method for dramatically lowering the Schottky  
19 barrier resistance at a metal/Si interface by  
20 interposing an ultrathin insulator is demonstrated for  
21 the first time."

22 And let me just ask you, Dr. Grupp, in  
23 general what does this paper describe?

24 A. This describes our invention.

25 Q. Okay. Put that down. And next I'm going to put up

1 PTX-91. Dr. Grupp, do you recognize this invention?

2 A. Yes, I do.

3 Q. And what is this?

4 A. This is another paper that we wrote.

11:20AM 5 Q. And when was this published?

6 A. In 2006.

7 THE COURT: You're going to need to speak up,  
8 Dr. Grupp.

9 THE WITNESS: Thank you, your Honor.

11:20AM 10 Q. And in general, what does this paper describe?

11 A. This paper also describes our invention as applied  
12 to a transistor.

13 Q. And let me ask you: Did these papers that we just  
14 showed, did these papers generate any interest in the  
11:20AM 15 scientific community?

16 A. Yes, they did.

17 Q. And how do you know that?

18 A. Because these papers have been referenced by over  
19 300 other journal articles.

11:20AM 20 Q. And when you say "referenced," what does that mean?

21 A. That means -- a reference is when a scientist or  
22 engineer writes a paper, they give credit and they say  
23 where their ideas came from, what is the origin of the  
24 work that they are doing. And so they -- in those  
11:21AM 25 papers, they would write that -- a reference or they



1 write down the details of this paper, where they found  
2 it, saying that we were the ones that inspired their  
3 work.

11:21AM

4 Q. And how many times have your papers been referenced  
5 by other scientists to date?

6 A. Over 300 times.

7 Q. Now, is that unusual, in your experience, for a  
8 scientific paper to be referenced and talked about in  
9 other papers over 300 times?

11:21AM

10 A. 300 times is a lot, that -- and so it's very  
11 unusual. So I have other papers that haven't come close  
12 to that. And it's not like -- it's not like "likes" on  
13 TikTok where you just hit a button and 300 would be  
14 significant.

11:21AM

15 300 is like hitting a game in the World  
16 Series in this kind of game, because what it means is  
17 that some scientist or engineer decided to focus months  
18 or years of their efforts and resources on this idea.

11:22AM

19 Q. Dr. Grupp, you mentioned earlier that you were  
20 working at Stanford for a while. Do you remember that  
21 testimony?

22 A. Yes.

23 Q. Did you ever share your research on this invention  
24 with anyone there?

11:22AM

25 A. Yes, I did.

1 Q. And who was that?

2 A. I would have shared it with Professor Jim Harris and  
3 Professor Krishna Saraswat and his graduate students.

4 Q. All right. And you mentioned the graduate students.

11:22AM 5 Do you remember discussing your invention with  
6 Dr. Saraswat specifically and his graduate students?

7 A. Yes, I do. We had a number of meetings, and I  
8 remember having a first long meeting where we told him  
9 all about our technology and how it worked, and they

11:22AM 10 were very interested.

11 Q. Now, you mentioned earlier your papers have been  
12 referenced by over 300 other scientists. Have your  
13 papers also been cited by Samsung?

14 A. Yes, they have.

11:23AM 15 Q. All right. Let's put up PTX-1087, and I'll direct  
16 your attention to this, Dr. Grupp. What is this  
17 document?

18 A. This is a journal article.

19 Q. And who prepared this journal article?

11:23AM 20 A. This is written by engineers at Samsung.

21 Q. And how do you know it's written by folks at  
22 Samsung?

23 A. Because the affiliation of where the engineers work  
24 is always written at the front of a paper; and it says  
11:23AM 25 here that these engineers worked at the Samsung Advanced

1 Institute of Technology and the Samsung Electronics  
2 Company.

3 Q. Okay. Now, let's go to the second column on the  
4 first page, and I want to direct your attention to the  
11:23AM 5 fourth sentence there, and it states -- we pointed it  
6 out; I'll quote it -- "To solve these problems, many  
7 researchers have tried to increase  $I_{th}$  by alleviating the  
8 Fermi-level pinning effect using thin oxide or nitride  
9 films."

11:24AM 10 Is that language familiar to you, Dr. Grupp?

11 A. Yes, it is.

12 Q. Why?

13 A. Well, I've read this before, and what it's saying is  
14 that they are giving credit to our work for inspiring  
11:24AM 15 work that they are doing, in particular because these  
16 little numbers, 17 through 19, are referring to the  
17 papers that are at the end of the article.

18 Q. Okay. Let me -- yeah. So let me just break that  
19 down. So you just mentioned those numbers, 17 and 19,  
11:24AM 20 right?

21 A. Yes.

22 Q. And let's go to the last page of the document and  
23 see if we can find the numbers there. And do you  
24 recognize what this list of numbers is? What's this  
11:24AM 25 part of the paper called?

1 A. This is the bibliography, or the references, of the  
2 paper.

11:25AM

3 Q. Okay. And you mentioned that there was a list from  
4 17 to 19 after that sentence. What's the significance  
5 of what you're seeing here?

11:25AM

6 A. That these are the papers that inspire their work;  
7 and in particular, they are listed in chronological  
8 order, that the one that comes first they list first,  
9 and ours is the one that's listed first; and that means  
10 that's a way to give credit to the people that invented  
11 it.

12 Q. And just briefly, looking at references 18 and 19,  
13 do you recognize any names there?

14 A. Yes, I do.

11:25AM

15 Q. And which ones do you recognize?

16 A. I recognize the name that's, "Saraswat, K," in both  
17 papers, and that would be Professor Saraswat at  
18 Stanford.

19 Q. Okay.

11:25AM

20 MR. CORDELL: Your Honor, I hate to interrupt,  
21 but at least typically we're given copies of these  
22 exhibits before when the examination occurs.

23 THE COURT: Does someone have an additional  
24 copy to share with opposing counsel?

11:25AM

25 MR. HUESTON: Yes.

1 MR. CORDELL: Your Honor, we would like all of  
2 them, if we could, so we could have them.

3 THE COURT: Well, we don't need to stop and do  
4 this each time.

11:26AM 5 MR. CORDELL: I've been doing my best to follow  
6 along, but it's just difficult.

7 THE COURT: It's all right, Counsel.

8 All right. If counsel will have a seat, we'll  
9 proceed.

11:26AM 10 Go ahead, Mr. Hueston.

11 MR. HUESTON: Thank you, your Honor.

12 Q. All right. So we were talking about these reference  
13 here, 17 to 19, and you just referenced Dr. Saraswat's  
14 name, correct?

11:27AM 15 A. Yes.

16 Q. Now let's go to Page 2 of this article, and I'd like  
17 for you here, at Page 2 of this article, to focus on the  
18 images in the top of Figure 1A. And what do these  
19 reflect?

11:27AM 20 A. These figures reflect an explanation of the  
21 underlying physics of how the invention works, what they  
22 are describing.

23 Q. And how is this image of significance to you?

24 A. Because it's the same images that we disclosed that  
11:27AM 25 describes our invention.

1 Q. Okay. And what is your reaction to seeing this  
2 Samsung article on these images?

3 A. Well, in one sense it's very satisfying that it says  
4 that, you know, we did something useful, that people are  
5 taking notice and they think it's valuable.

6 Q. And let's look at the bottom of Page 1. I'd like to  
7 blow that out.

8 And can you tell when Samsung published this  
9 article?

10 A. Yes, sir.

11 MR. CORDELL: Your Honor, I have to object to  
12 lack of foundation. He's having a lay witness interpret  
13 these documents. I got no notice --

14 THE COURT: Do you have a response?

15 MR. HUESTON: Yes. He is a scientist and he  
16 has testified that he carefully tracked who had been  
17 publishing and following his work, and that's exactly  
18 what he is noting here.

19 THE COURT: Well, then, if you will lay that  
20 foundation in anticipation of these direct questions, I  
21 think we'll be all right.

22 MR. HUESTON: All right. Thank you.

23 THE COURT: I'll overrule the objection at this  
24 time, based upon a foundation being laid going forward.

25 MR. HUESTON: Thank you, your Honor.

1 Q. So, Dr. Grupp, did you, in fact, monitor, once your  
2 papers were published, other scientists and other folks  
3 writing about your invention?

4 A. Yes, I did.

11:28AM 5 Q. And do you remember, in fact, reading and finding  
6 this article as you monitored?

7 A. Yes, I do.

8 Q. All right. Great. And by the way, when was this  
9 published?

11:29AM 10 A. In 2013.

11 Q. Okay. You can take that down.

12 And did you continue to monitor the publishing  
13 by other scientists and engineers in the years  
14 afterwards on your papers?

11:29AM 15 A. Yes.

16 Q. And why would you do that, by the way?

17 A. Well, for several reasons. I'd want to know that my  
18 work had impact and I'd want to see how it's moving out  
19 into the world.

11:29AM 20 Q. Okay. So let me show you PTX-19 and ask you if you  
21 can identify this document.

22 A. Yes.

23 Q. And what is this?

24 A. This is a -- it's kind of like a -- it's like a  
11:29AM 25 paper, but it's just the short version that might have

1 been submitted to a conference.

2 Q. Okay. And who, can you tell, was this prepared by?

3 A. By engineers at Samsung.

4 Q. And let's look at the bottom of the page. Do you

11:30AM 5 see where it says, "References"?

6 A. Yes, I do.

7 Q. And does Reference Number 4 look familiar to you?

8 A. Yes, it does.

9 Q. And who is that there?

11:30AM 10 A. That's --

11 Q. In Reference 4?

12 A. That's Dr. Connelly and myself and other Acorn  
13 employees.

14 Q. Okay. Let's scroll that down and let's go to

11:30AM 15 PTX-1103, and I'll ask you if you recognize this  
16 document.

17 A. Yes, I do.

18 Q. And what is this?

19 A. This is another journal article.

11:30AM 20 Q. And who is this written by?

21 A. Samsung engineers.

22 Q. Okay. Let's look at the bottom of this page, to  
23 where it says "References." You see that?

24 A. Yes.

11:30AM 25 Q. Okay. I want to direct your attention to Number 11



1 and ask if that one looks familiar to you.

2 A. Yes, it does.

3 Q. And what does it show?

4 A. That is another of our papers.

11:30AM 5 Q. Okay. Relating to the invention?

6 A. Yes.

7 Q. Let's go back to the first page of this article and  
8 let's look on the left side. When did Samsung publish  
9 this article?

11:31AM 10 A. This article was published in 2018.

11 Q. Now, earlier Samsung's lawyer, in opening, suggested  
12 that Samsung didn't know about your patents before the  
13 lawsuit in 2019. What is your reaction to that?

14 A. I can't see how that can be true.

11:31AM 15 MR. CORDELL: Objection to foundation, your  
16 Honor.

17 THE COURT: Sustained.

18 Q. Dr. Grupp, in your experience, is it difficult to  
19 find a patent?

11:31AM 20 A. No.

21 Q. How does one find a patent?

22 A. You would just go on --

23 MR. CORDELL: Same objection. Again, calls for  
24 opinion, your Honor.

11:31AM 25 MR. HUESTON: I just asked him how he does it.

1 THE COURT: He can testify as to how he locates  
2 patents but not opine as to how everybody does it.

3 Restate the question, counsel.

4 MR. HUESTON: Thank you, your Honor.

11:31AM 5 Q. Dr. Grupp, how do you find patents?

6 A. I go on Google Patents and I would do something like  
7 put in my name and hit "enter," and my patents would all  
8 show up.

9 Q. All 37?

11:32AM 10 A. Yes.

11 Q. All right. Let's now go to PTX-2460, and I'm going  
12 to ask you whether you recognize this patent.

13 A. I don't know the numbers.

14 Q. Let's go to the next page. Yeah, there we go. Do  
11:32AM 15 you recognize this patent?

16 A. Yes, I do.

17 Q. And let's go to the second page of this. It says,  
18 "Assignee: Samsung Electronics Company." Let's get  
19 there. It's the next. Let me ask you, what does

11:32AM 20 "assignee" mean in a patent?

21 A. That's -- the assignee is the person that owns the  
22 patent.

23 Q. And so what does that indicate here on the patent?

24 A. That Samsung Electronics Company owns this patent.

11:33AM 25 Q. Okay. Now let's look at the top right. When was

1 this patent issued?

2 A. This patent was issued in 2009.

3 Q. Now let's look to the bottom left. It says,

4 "References cited." Do you see that?

11:33AM 5 A. Yes, I do.

6 Q. And it says, "U.S. Patent Documents"; is that right?

7 A. Yes.

8 Q. And by the way, what does it mean, in your  
9 experience, in a patent to have references cited in U.S.

11:33AM 10 Patent Documents? What is that?

11 A. References in a patent are saying, "This is the work  
12 that came before us."

13 Q. Okay. And then looking at those references, does  
14 any of those references look familiar to you? Let's go  
15 to the second column at the top. There we go.

11:33AM

16 A. Yes, they do.

17 Q. And which ones?

18 A. There's one in the middle that ends in 736 that  
19 says, "Grupp, *et al.*"

11:34AM 20 Q. And what is that?

21 A. That is one of our patents. Actually, that's a  
22 patent application.

23 Q. And does that patent have any relation to the  
24 patents at issue in this case?

11:34AM 25 A. Yes, it does.

1 Q. Okay. And is this the -- by the way, did you  
2 review -- have you, as part of thinking and monitoring  
3 as to whether your invention is still being talked about  
4 -- you talked about this in the context of the journal  
11:34AM 5 articles. Have you also done this with patents to see  
6 who's been citing your inventions?

7 A. Yes, I have.

8 Q. All right. Let me go to Grupp Demonstrative Number  
9 2. You can put that up. And I'm going to ask you,  
11:34AM 10 Dr. Grupp, what does this slide reflect?

11 A. This slide reflects Samsung's patents and lists ones  
12 that have references to our patents.

13 Q. And so the first one, May 19, 2009, does that  
14 indicate a reference to your patent?

11:35AM 15 A. Yes, that's the one we were just looking at. That  
16 refers to our '736 application.

17 Q. Okay. And just briefly, how many others are there  
18 and what are the years?

19 A. There are five in total, and the years are 2009,  
11:35AM 20 2010, 2017, 2018, and 2018.

21 Q. And, Dr. Grupp, having seen all these Samsung  
22 patents referencing your inventions as prior art, what  
23 does that suggest to you?

24 MR. CORDELL: Objection, your Honor.

11:35AM 25 THE COURT: Sustained. This is a fact witness.

1 He's not entitled to give opinions.

2 MR. HUESTON: All right.

3 Q. Dr. Grupp, these are the additional five where you  
4 reference your patent being cited; is that right?

11:35AM 5 A. That's correct.

6 MR. HUESTON: All right. Thank you, your  
7 Honor. No more questions at this time.

8 THE COURT: You pass the witness at this time?

9 MR. HUESTON: Yes, your Honor.

11:36AM 10 THE COURT: Cross-examination by the  
11 Defendants?

12 All right, Mr. Cordell. You may proceed with  
13 cross-examination.

14 MR. CORDELL: Thank you, your Honor.

11:36AM 15 CROSS-EXAMINATION

16 BY MR. CORDELL:

17 Q. Good morning, Dr. Grupp.

18 A. Good morning, sir.

19 Q. Well, my name is Ruffin Cordell. I don't think  
11:36AM 20 we've met before; is that right?

21 A. That's correct.

22 Q. So if I can have your last demonstrative kept up.  
23 Can we put that back up, where you listed all these  
24 patents?

11:37AM 25 So here in your demonstrative, I guess it's

1 Exhibit 1 -- I thought it was Exhibit 2 -- you list a  
2 bunch of Samsung patents, correct?

3 A. Yes.

11:37AM

4 Q. And you say in those Samsung patents, they cite a  
5 bunch of your patents, right?

6 A. Yes.

7 Q. But isn't it a fact, sir, that not any of the  
8 patents that you show in this slide are actually at  
9 issue in this case?

11:37AM

10 A. I couldn't say.

11 Q. You don't know?

12 A. I know -- what I know is that all of these, I've  
13 read these references, and they all refer to our family  
14 of patents.

11:37AM

15 Q. Isn't it a fact, Dr. Grupp, every single of the five  
16 Grupp patents you've highlighted here are nowhere  
17 asserted in this case, correct?

18 A. I wouldn't be able to say that.

19 Q. You just don't know one way or the other?

11:38AM

20 A. That's not something I've looked at. What I know is  
21 that they are all related in the same family.

22 Q. Well, when you testified before this jury and you  
23 told them that Samsung was citing your patents, didn't  
24 you mean to suggest that Samsung had seen the patents in  
25 this case?

11:38AM

1 A. What I mean to say is that Samsung knows about our  
2 technology very clearly.

3 Q. Dr. Grupp, when you sat in that stand, when you  
4 testified a few moments ago that Samsung knew about your  
11:38AM 5 patents, you didn't mean the patents in this case?

6 A. What I mean is that we --

7 Q. Can you answer my question, sir?

8 THE COURT: Counsel, if you believe the witness  
9 is nonresponsive, raise it with the Court.

11:38AM 10 MR. CORDELL: Thank you, your Honor.

11 THE COURT: And, Dr. Grupp, you are going to  
12 need to answer the questions as asked. If Mr. Hueston  
13 wants to revisit this on direct, you'll have that  
14 opportunity, but you need to answer the questions as put  
11:38AM 15 forward by counsel.

16 THE WITNESS: Thank you, your Honor.

17 THE COURT: Restate your question, Mr. Cordell.

18 Q. Isn't it a fact, Dr. Grupp, that when you sat there  
19 and testified that Samsung knew about your patents, you  
11:39AM 20 suggested they knew about the patents in this case,  
21 correct?

22 A. Yes.

23 Q. And it turns out you don't know whether these are  
24 patents in this case or not, right?

11:39AM 25 A. No.

1 Q. You have 37 patents, right?

2 A. Yes.

3 Q. Now, you don't work for Acorn anymore, correct?

4 A. That's incorrect.

11:39AM 5 Q. That's incorrect? So --

6 A. I -- may I clarify?

7 Q. Well, let me see if I can figure out where I went  
8 wrong. I thought you left the company several years  
9 ago; is that not right?

11:39AM 10 A. May I clarify?

11 Q. Well --

12 THE COURT: You may answer the question.

13 THE WITNESS: I know.

14 THE COURT: Did you leave the company several  
11:39AM 15 years ago?

16 THE WITNESS: I left the company several years  
17 ago.

18 Q. In fact, you left in 2005, right?

19 A. Yes, and I've been consulting for them on and off  
11:39AM 20 since.

21 Q. Okay. But let's see if we can take this apart. So  
22 you were employed by Acorn Technologies from 2000 to  
23 2005, correct?

24 A. That's correct.

11:40AM 25 Q. And when you say you've been consulting with them on



1 and off, you had two contracts with Acorn, right?

2 A. That's correct.

3 Q. And the first one, you never did anything under,  
4 right?

11:40AM 5 A. That's correct.

6 Q. So, you know, after 2005, you went off and did your  
7 medical devices and other things?

8 A. That's correct.

9 Q. Okay. And in 2018, you signed another contract with  
11:40AM 10 Acorn, right?

11 A. That's correct.

12 Q. And that second contract had to do with your work in  
13 this case, right?

14 A. That's incorrect.

11:40AM 15 Q. Well, when we asked you about the nature of your  
16 work under the 2018 contract, you couldn't tell us,  
17 right?

18 A. I don't believe that's correct.

19 MR. CORDELL: Well, Mr. Sayres, could I have  
11:40AM 20 Mr. Grupp's deposition.

21 Q. Do you remember your deposition, Dr. Grupp?

22 A. Yes, I do.

23 Q. And you swore to tell the truth in that deposition,  
24 right?

11:41AM 25 A. Yes, I did.

1 Q. Just like you did here today?

2 A. Yes.

3 Q. Okay.

4 MR. CORDELL: Can I have Dr. Grupp's deposition  
11:41AM 5 at Page 23, Line 14 through 24, Line 1.

6 Mr. Sayres, do you have the video for this?

7 (Whereupon, video deposition testimony of  
8 Dr. Grupp played as follows:)

9 Q. "And what was the nature of the work you provided  
11:41AM 10 under the second contractual relationship?"

11 A. "The nature of the work? What does 'nature' mean"?

12 Q. "You don't understand the term 'nature of the work'?"

13 A. "I don't understand the term 'nature of the work.'"

14 (End of video testimony.)

11:41AM 15 Q. And yet, Dr. Grupp, when you took the stand this  
16 morning, one of the first questions you answered was the  
17 nature of your work for Acorn, right?

18 A. Yes.

19 Q. And you're being paid under that contract, correct?

11:42AM 20 A. Yes.

21 Q. And you've been paid for your work on this piece of  
22 litigation, right?

23 A. I am being paid for my work in this litigation, yes.

24 Q. And you are making \$250 an hour?

11:42AM 25 A. Yes, I am.

1 Q. Do you have any idea how much you've actually billed  
2 and been paid for by Acorn under the second contract?

3 A. I haven't submitted all my invoices, so it  
4 approximately comes to a total, to date, of about  
5 \$20,000 over a year or two.

11:42AM

6 Q. Now, Dr. Grupp, you don't have any current ownership  
7 of Acorn, right?

8 A. No. That's incorrect.

9 Q. That is incorrect?

11:42AM

10 A. Yes.

11 Q. I'm sorry. So you do have an ownership of Acorn?

12 A. I have a minuscule amount of stock in Acorn.

13 Q. Okay. But more than that, sir, you have a financial  
14 interest in the outcome of this case, right?

11:43AM

15 A. Well, no. In a sense, no. It's so small that it  
16 doesn't move my needle.

17 Q. Well, when we asked you at your deposition, you  
18 couldn't tell us whether or not you had a financial  
19 interest in the outcome of this case, right?

11:43AM

20 A. That's correct, because I don't know how much stock  
21 I have. It's small, but I don't know. So when you  
22 asked me what my interest is, my answer is I'm not  
23 really very interested because it's so small.

24 Q. You didn't tell us that you had stock in Acorn,  
25 right?

11:43AM

1 A. I wasn't asked whether I had stock in Acorn.

2 Q. Well, you were asked pretty directly whether you had  
3 any financial interest.

11:43AM

4 A. You asked me whether I have an interest, and that  
5 means am I interested in it. You didn't ask me whether  
6 I have an ownership in the company. That's a different  
7 question. I'm not really very interested because it's  
8 so small; it's not going to change my life one way or  
9 the other.

11:43AM

10 Q. So you just didn't understand what he meant when he  
11 asked if you had a financial interest?

12 A. I'm a scientist and a plans man. I like to be  
13 clear, especially in a deposition. I think it was an  
14 unclear question.

11:43AM

15 Q. I see. Okay. Well, let's talk a little bit more  
16 about your invention.

17 MR. CORDELL: Could I have PTX-1304, which is  
18 the '167 Patent.

19 Q. This is your patent, right?

11:44AM

20 A. Yes.

21 Q. And while we're here, you see the reference as  
22 cited? You testified about that a few moments ago,  
23 right? On the right-hand side, this area?

24 A. Yes.

11:44AM

25 Q. Yeah. Did you copy those other patents as part of

1 your '167 Patent?

2 A. I did not understand the question.

3 Q. Very simple. Did you read those patents? You  
4 talked about references cited in your direct testimony.

11:44AM 5 Did you read those two patents?

6 A. Yes, I read those patents.

7 Q. Did you copy them when you were filing your '167  
8 Patent?

9 A. Did I copy them, meaning did I use information from  
11:44AM 10 them in what I wrote?

11 Q. Yes.

12 A. No.

13 Q. You say no, you did not copy them?

14 A. That's correct.

11:45AM 15 Q. And, in fact, the purpose of these references cited  
16 is to show the patent office what other people have done  
17 before you, right?

18 A. Yes.

19 Q. And that's -- that means that your patent can't  
11:45AM 20 cover the same thing that they already did, right?

21 A. That's correct.

22 Q. You understand that when there's something in the  
23 prior art, your patent's going to have to go in a  
24 different direction, fair?

11:45AM 25 A. That's correct.

1 Q. I'd love to patent the light bulb, but I'm probably  
2 not going to get away with that today; is that right?

3 A. That's correct.

4 Q. Okay. Now, you talked a lot about alligators in  
11:45AM 5 your direct testimony. Is there anything in this '167  
6 Patent about alligators?

7 A. By analogy, there certainly is.

8 Q. Okay. Well, certainly, I've read it a few times,  
9 and I didn't see alligators. Would you like to point  
11:45AM 10 out where that is?

11 A. Sir, there are not alligators, but as I said, that  
12 it's an analogy to -- I was very clear that that's the  
13 analogy to the MIGS.

14 Q. Okay. Now, you mentioned the Schottky effect,  
11:46AM 15 right?

16 A. It's called the Schottky barrier, yes.

17 Q. Okay. The Schottky barrier. And people have known  
18 about that for almost a hundred years; is that right?

19 A. Not quite that long.

11:46AM 20 Q. Not quite? Well, all right. In your patent, it  
21 says, at Column 142 through 45, that somebody named  
22 Grondahl and Geiger first studied the rectifying form of  
23 these junctions in 1926. That's almost a hundred years,  
24 right?

11:46AM 25 A. Yes, but I don't believe the Schottky barrier was

1 explained until Schottky did his work in the '40s or  
2 '50s.

3 Q. Well, you say 1938, here, right? It was a long time  
4 ago, fair?

11:46AM 5 A. I agree.

6 Q. Now --

7 THE COURT: Dr. Grupp, you're going to have to  
8 speak up. You're getting awfully soft. I want to make  
9 sure the jury hears your answers.

11:47AM 10 THE WITNESS: Thank you, your Honor. It sounds  
11 loud to me. I apologize.

12 THE COURT: If you get too loud, I'll tell you.  
13 Next question, Counsel.

14 MR. CORDELL: Thank you, your Honor.

11:47AM 15 Q. So this patent case, we heard this morning, is about  
16 the junction between semiconductor and metal, right?

17 A. Yes, that's correct.

18 Q. And there were people in the prior art that came  
19 before you who had worked on the junction between

11:47AM 20 semiconductor and metal, right?

21 A. That's correct.

22 Q. And there were people in the prior art that used  
23 metal silicide as the junction between semiconductor and  
24 metal, correct?

11:47AM 25 A. Yes.

1 Q. And that was done before you came along, right?

2 A. Yes.

3 Q. And it is your view that for forming a metal  
4 silicide on the surface of a semiconductor does not  
11:47AM 5 practice your invention, correct?

6 A. Using, to be clear --

7 Q. Can you answer my question, sir?

8 MR. CORDELL: I'm sorry, your Honor.

9 A. You didn't define the system clearly. If you define  
11:48AM 10 a clear system, I'll tell you the answer.

11 THE COURT: Just a minute. Dr. Grupp, if you  
12 don't understand the question, just answer, "I don't  
13 understand the question." Don't explain why you don't  
14 understand it or how you don't understand it or what  
11:48AM 15 additional information you'd like. If you don't  
16 understand it to the level that you can give a direct  
17 answer, tell counsel, "I don't understand the question."  
18 That's all you need to say, all right?

19 THE WITNESS: Understood, your Honor.

11:48AM 20 A. I don't understand the question.

21 Q. Let me try it again. So if you're forming a metal  
22 silicide directly on a semiconductor surface, you are  
23 not practicing your invention, right?

24 A. That's correct.

11:48AM 25 Q. So if we've got a junction that consists of a metal



1 silicide directly on a semiconductor, we're not  
2 practicing your invention, correct?

3 A. That's correct. If there's no interface layer, it  
4 does not practice our invention.

11:48AM

5 Q. Now, you talked about some of the work you did  
6 leading up to the invention. Do you remember that?

7 A. Yes.

8 Q. You talked about you and Dr. Connelly getting  
9 together and doing experiments. Do you remember that?

11:49AM

10 A. Yes.

11 Q. Now, you did lots of experiments, but you never  
12 actually made a commercial product at Acorn, right?

13 A. We didn't make a complete transistor, and I'm not --  
14 I don't understand the nature of "commercial product,"  
15 as you're asking it.

11:49AM

16 Q. Well, Acorn certainly tried to make a commercial  
17 product, correct?

18 A. No.

19 Q. Well, when you were employed by Acorn, your efforts  
20 were directed toward making a commercial product, right?

11:49AM

21 A. I'm unclear about what you mean by "commercial  
22 product," so I don't understand the question.

23 MR. CORDELL: Can I have Dr. Grupp's deposition  
24 at Page 108, Lines 4 through 7.

11:50AM

25 Q. So, Dr. Grupp, do you recall being asked at your

1 deposition --

2 MR. CORDELL: We may have to back up,  
3 Mr. Sayres. I'm sorry. Could we back it up to the  
4 prior page? So at Line 25, 107, Line 25, let's begin  
11:50AM 5 there.

6 Q. Okay. So, Dr. Grupp, do you recall being asked,  
7 "Were there efforts by Acorn, during your time there, to  
8 come up with a commercial product using the technology  
9 of the '423 Patent?"

11:50AM 10 You answer, "Yes."

11 Question: "And what, generally, were those  
12 efforts?"

13 Answer: "My -- my efforts were always aimed at  
14 producing a commercial product."

11:50AM 15 Q. Is that your testimony, sir?

16 A. Yes.

17 Q. So, in fact, your goal was to make a commercial  
18 product at Acorn, right?

19 A. No. I aimed at producing -- I clearly said, "Aimed  
11:51AM 20 at producing a commercial product." It's not the same  
21 as -- we had a fab at Stanford. We're not going to make  
22 a commercial product. We're making something that's  
23 aimed at producing it, aimed at.

24 Q. I'll let the jury decide that one, your Honor.

11:51AM 25 THE COURT: All right. We're not going to have

1 comments about what the jury will or won't decide.

2 That's an improper sidebar.

3 And, Dr. Grupp, I've told you to limit your  
4 answers to the questions asked. You said, "No, that  
11:51AM 5 wasn't right." He didn't ask you to explain why it  
6 wasn't right, and then you launched into an explanation.  
7 Limit your answers to the questions asked.

8 Mr. Hueston's going to get to follow up with  
9 any area he thinks he needs to follow up with. That is  
11:51AM 10 his decision; it is not your decision.

11 And, counsel, you need to refrain from further  
12 sidebar remarks.

13 MR. CORDELL: I will, your Honor. Thank you.

14 THE COURT: Let's proceed with this  
11:51AM 15 cross-examination.

16 MR. CORDELL: Yes.

17 Q. Now, Dr. Grupp, one thing we can agree is that  
18 during your time at Acorn, they never made a commercial  
19 product, fair?

11:52AM 20 A. Yes.

21 Q. And during your time at Acorn, you were never  
22 actually able to create a physical device that had a  
23 layer of metal oxide as the interface, correct?

24 A. No.

11:52AM 25 Q. Well, maybe my question wasn't clear. Did you

1 create a physical device with a layer of metal oxide as  
2 the interface?

3 A. Yes.

4 Q. Do you know what it means to reduce to practice,  
11:52AM 5 Dr. Grupp?

6 A. Yes.

7 Q. And that means that you took your invention and the  
8 patents and you actually made a physical device out of  
9 it, right?

11:52AM 10 A. Yes.

11 Q. And, again, when you were deposed, you told us that  
12 you did not make a physical device that was a reduction  
13 to practice of your invention, correct?

14 A. Yes.

11:52AM 15 Q. And on the stand here just now, I think you told us  
16 that you did make a physical device; is that right?

17 A. That's correct.

18 Q. Well, whether or not you made a physical device --  
19 actually, let me go ahead and show it, if I can. The  
11:53AM 20 Grupp deposition at Page 99, Lines 10 through 15.

21 (Video played as follows:)

22 Q. "Did you ever reduce anything to practice using a  
23 metal oxide as the interface layer or as part of the  
24 interface layer?"

11:53AM 25 A. "Not in -- not in a physical device."

1 (End of video testimony.)

2 Q. So, Dr. Grupp, you did some tests at Stanford; is  
3 that right?

4 A. Yes.

11:53AM 5 Q. And the purposes -- and these tests were, like, in  
6 the 2002 time frame; is that right?

7 A. Yes.

8 Q. And you said a few moments ago that Dr. Connelly was  
9 your partner in all of this?

11:54AM 10 A. Yes.

11 Q. And you believe Dr. Connelly is a pretty bright guy?  
12 I think that's what you testified.

13 A. Yes.

14 Q. But according to Dr. Connelly, your tests at  
11:54AM 15 Stanford were disappointing, correct?

16 A. No.

17 Q. Well, okay. I'll -- I will get back to that.

18 MR. CORDELL: Can I have just one moment, your  
19 Honor?

11:54AM 20 THE COURT: You may.

21 Q. So it turns out you were right about that. It  
22 wasn't Dr. Connelly. It was Mr. Clifton who said that  
23 the results were disappointing. Do you recall that?

24 A. No.

11:55AM 25 MR. CORDELL: So, your Honor, this is 30(b)(6)

1 testimony I'd like to publish.

2 MR. HUESTON: Your Honor, we object. This was  
3 the subject of an agreed-upon exclusion of testimony  
4 between counsel last week.

11:55AM 5 MR. CORDELL: This is the 30(b)(6) testimony of  
6 Mr. Clifton.

7 THE COURT: All right. I'll take this up  
8 outside the jury's presence. It's five minutes until  
9 noon.

11:55AM 10 Ladies and gentlemen, I'm going to let you  
11 recess for lunch. Your lunch is waiting for you in the  
12 jury room, I am told, by Ms. Clendening. If you will  
13 take your notebooks with you, make sure you follow all  
14 my instructions, including not to discuss anything about  
11:55AM 15 the case among yourselves. We'll be back from lunch in  
16 approximately an hour and will continue with this at  
17 that time. The jury is excused for lunch.

18 (Whereupon, the jury exits the courtroom.)

19 THE COURT: Be seated.

11:56AM 20 All right. Mr. Cordell, tell me what this is  
21 and how you intend to use it, then I'll hear from  
22 Mr. Hueston.

23 MR. CORDELL: Sure. Can we publish it to the  
24 Court? You don't have to play the clip, just have the  
11:56AM 25 words.

1 I'm sorry. It's Clifton 52-4 through 53-6.

2 THE COURT: All right. This is deposition  
3 testimony by somebody other than the witness. What's  
4 your intended purpose?

11:57AM

5 MR. CORDELL: It's 30(b)(6) testimony. It's  
6 used for impeachment. I'm wondering if we should do  
7 this outside the presence of the witness, your Honor.

11:57AM

8 MR. HUESTON: Your Honor, if I may, I think I  
9 can help shortcut this. I have the e-mail here where  
10 this very particular depo excerpt that was just  
11 published was agreed upon between both law firms last  
12 night. "Sounds like we've reached an agreement, will  
13 not be used."

11:57AM

14 MR. CORDELL: I think that agreement had to do  
15 with whether or not we were going to play those depo  
16 clips in open court as depo clips. I don't think we  
17 agreed that we wouldn't use any of it for impeachment.

18 MR. HUESTON: No. Clearly --

11:58AM

19 THE COURT: All right. Let's do this. We're  
20 going to recess for lunch, and I'll see counsel in the  
21 chambers outside the presence of the witness, and we'll  
22 get to the bottom of this, all right?

23 MR. CORDELL: Thank you.

24 THE COURT: The court stands in recess.

11:58AM

25 (Lunch recess from 11:58 a.m. to 1:21 p.m.)

1 THE COURT: All right. Are we ready to  
2 proceed, counsel? I understand we had some technical  
3 issues. Is everybody ready to go?

4 MR. DIXON: Yes, your Honor.

01:21PM

5 MR. CORDELL: Yes, your Honor.

6 THE COURT: All right. Dr. Grupp, if you'll  
7 return to the witness stand, please. I'll remind you,  
8 you remain under oath.

01:21PM

9 While he's getting situated, if you'd bring in  
10 the jury, please.

11 (Whereupon the jury enters the courtroom.)

12 THE COURT: Please be seated, ladies and  
13 gentlemen. We will continue with the Defendants'  
14 cross-examination of Dr. Dan Grupp.

01:22PM

15 Mr. Cordell, you may proceed.

16 MR. CORDELL: Thank you, your Honor.

17 Q. Good afternoon, Dr. Grupp.

18 A. Good afternoon, sir.

19 Q. Now, before the break, you had testified about this

01:22PM

20 PTX -- take my notes off -- PTX-1087. Try it again.

21 There we go. Do you remember that, sir?

22 A. Yes.

23 Q. I'll show you the title, if that helps.

24 A. Thank you. Yes.

01:22PM

25 Q. Do you recall telling the jury about this?



1 A. Yes, I do.

2 Q. And you said, in your testimony, that somehow  
3 Samsung, well, they cited your paper in this paper; is  
4 that right?

01:22PM 5 A. Yes, that's correct.

6 Q. And you somehow suggested that Samsung had copied  
7 some of your work or something; is that right?

8 A. No.

9 Q. Okay. Well, you did -- you said something about  
01:23PM 10 Samsung, right?

11 A. Yes.

12 Q. And let me ask you this: Do you know any of the  
13 folks listed at the top of this article?

14 A. No.

01:23PM 15 Q. You testified that they -- that they wrote this,  
16 right?

17 A. Yes.

18 Q. But you're just reading the page, right?

19 A. That's correct.

01:23PM 20 Q. You don't know Mr. Kyung-Eun Byun, do you?

21 A. No.

22 Q. Okay. And you're not in the habit of accusing  
23 people that you've never met of things, right?

24 A. No.

01:23PM 25 Q. So let's look down a little bit to the part here

1 that you referred us all to, and I believe it was this  
2 sentence. It begins with "To." I'll get this right.

3 "To solve these problems, many researchers  
4 have tried to increase the  $I_{th}$  by alleviating the  
01:24PM 5 Fermi-level pinning effect using thin oxide and nitride  
6 films." That was the sentence you pointed to, right?

7 A. Yes.

8 Q. And you said that was a reference to your work,  
9 right?

01:24PM 10 A. Yes.

11 Q. But, sir, you didn't read the next sentence, did  
12 you? "However, these dielectric films can add  
13 additional tunneling barriers where even a few atomic  
14 layers can further reduce the tunneling currently  
01:24PM 15 rapidly," right?

16 A. I don't know what your question is.

17 Q. My question is you didn't bother to read the  
18 sentence that followed the passage you showed the jury,  
19 right?

01:24PM 20 A. No.

21 Q. And, in fact, that sentence says, you know, maybe  
22 you shouldn't use these dielectric films, right?

23 A. No.

24 Q. It says they have additional tunneling barriers,  
01:24PM 25 right?

1 A. Yes, it says they have additional tunneling  
2 barriers.

3 Q. And that means that your metal oxide, semiconductor  
4 oxide approach has these tunneling barriers, right?

01:25PM 5 A. I am unclear what the question is.

6 Q. Well, they seem to refer to these dielectric films.  
7 Those are your dielectric films, right?

8 A. Yes.

9 Q. And when they say, "Your dielectric films," they are  
01:25PM 10 talking about a layer of metal oxide and a layer of  
11 semiconductor oxide, right?

12 A. Yes.

13 Q. And they say that increases these tunneling  
14 problems, right? I should have said, "Tunneling  
01:25PM 15 barriers." I apologize.

16 A. They say that dielectric films have tunneling  
17 barriers.

18 Q. Everybody knows that, right? Oxides block electric  
19 current, right?

01:25PM 20 A. No.

21 Q. Okay. Well, when you say they are relying on your  
22 work, they seem to say, "However, your films have these  
23 tunneling barrier problems," right?

24 A. I wouldn't put it that way, no.

01:26PM 25 Q. But that's the words that are written there, sir,

1 right?

2 A. I wouldn't read them that way.

3 Q. Well, let's look at another one of your papers --

4 or, I'm sorry, one of the Samsung papers that you

01:26PM

5 pointed to. This is PTX-19. Do you remember that?

6 A. Yes.

7 Q. Okay. And this has some other folks, although

8 Mr. Byun is in this one. Do you know any of these folks

9 that wrote this paper?

01:26PM

10 A. No, I don't.

11 Q. Do you know anything about the way they work or how

12 they work or what they do?

13 A. Yes.

14 Q. Meaning you don't know, right?

01:26PM

15 A. Meaning that I do know something about that.

16 Q. Okay. Well, you know that they are listed as being

17 from Samsung, some Samsung entity, correct?

18 A. That's correct.

19 Q. But you've never met any of them, right?

01:26PM

20 A. I have not met them, that's correct.

21 Q. You've never traveled over to Samsung in Korea, for

22 example, correct?

23 A. I have not been at Samsung in Korea.

24 Q. You've never met -- you've never gone over to

01:27PM

25 Samsung in Texas, correct?

1 A. That's correct.

2 Q. Okay. So here, what you pointed us to -- and I'll  
3 come around here so I can actually see it -- is you  
4 pointed to this passage in the middle of the page, one,  
01:27PM 5 two, three paragraphs down, right?

6 A. I'm sorry, sir. I can't see the third paragraph.

7 Q. Oh, I'm sorry. That's what I get for walking around  
8 it. Okay.

9 So what you did is you pointed to this  
01:27PM 10 third paragraph that begins, "The current approach,"  
11 right?

12 A. Yes.

13 Q. And you said, "As an alternate option,  
14 metal-insulator-semiconductor structure was presented."  
01:27PM 15 That's a reference to what you think is your technology,  
16 right?

17 A. Yes.

18 Q. But then the authors tell us, two sentences later,  
19 we've got another "however."

01:28PM 20 "However, this technique has lack of  
21 thermal stability and thickness controllability of  
22 insulator layer," right?

23 A. What is the question?

24 Q. Well, do you see that, sir?

01:28PM 25 A. I do see what they are saying, yes.

1 Q. They say --

2 A. I do see, "However."

3 Q. They say, "However, this technique" -- referring to  
4 MIS, which is your technology -- "lacks thermal  
01:28PM 5 stability and thickness controllability of the insulator  
6 layer," correct?

7 A. Are you asking about my technology or what they say?  
8 I'm unclear.

9 Q. I'm just hoping you can answer my question.

01:28PM 10 A. Okay.

11 Q. They are saying that in their view, your technique  
12 lacks thermal stability and thickness controllability of  
13 the insulator layer, right?

14 A. Sure.

01:28PM 15 Q. Yeah. You may disagree with them, but at least  
16 these Samsung engineers thought your MIS had some  
17 problems, fair?

18 A. Kind of --

01:29PM 19 MR. HUESTON: Objection, your Honor. Calls for  
20 speculation.

21 THE COURT: It does call for speculation, but  
22 the witness was in the process of answering the  
23 question, so I'll deem the objection untimely. Let's  
24 move on.

01:29PM 25 Q. So just to orient everybody, this is one of the

1 papers that you said cited back to your work here, down  
2 here in Footnote 4, right?

3 A. Yes.

4 Q. That's your 2006 paper; is that right?

01:29PM

5 A. Yes.

6 MR. CORDELL: Mr. Sayres, can we pull up that  
7 2006 paper, which I believe is PTX-91.

01:29PM

8 Q. It turns out PTX-91 has nothing to do with the metal  
9 oxide, semiconductor oxide technology we've been talking  
10 about here today, right?

11 A. No.

12 Q. It talks about metal source/drains, right?

13 A. Yes.

01:30PM

14 Q. That's the first -- well, three out of the first  
15 four words of the paper, right?

16 A. Yes.

17 Q. And that refers to a technology where, instead of  
18 using silicon for that source and drain, you make it out  
19 of metal, right?

01:30PM

20 A. No.

21 MR. CORDELL: Can I have Dr. Grupp's deposition  
22 at Page 108, Lines 17 through 20.

23 Question: "When you say, 'Metal source/drain  
24 MOSFETs,' is that a MOSFET where you actually form the  
25 source and drain with a metal instead of the

01:31PM

1 semiconductor?"

2 And your answer, sir, was, "Yes."

3 Do you recall that testimony?

4 A. Yes.

01:31PM

5 Q. And you were looking at metal source and drains  
6 rather than silicon because you thought you might be  
7 able to commercialize that, right?

8 A. Yes.

01:31PM

9 Q. And you don't know whether Acorn ever succeeded in  
10 commercializing a metal source/drain transistor, right?

11 A. No.

12 Q. And you do know that Samsung has never made a --  
13 well, let me strike that. "Never" is a big word.

01:31PM

14 You know that, in this case, the products we're  
15 talking about don't have metal sources and drain  
16 regions, correct?

17 A. No. Incorrect.

18 Q. So you believe they do have metal source/drain  
19 regions?

01:32PM

20 A. Silicide is a metal in my definition of metals.

21 Q. I see. I don't want to go back and play your  
22 testimony again, sir, but you just -- I just showed you  
23 your deposition where you said that metal source/drain  
24 transistors are those where the source and drain are  
01:32PM 25 actually formed of a metal. Do you recall that?



1 A. That's right; and I'm a physicist, and silicide is a  
2 type of metal --

3 Q. Okay.

4 A. -- if it's a conductor.

01:32PM

5 THE COURT: All right. Dr. Grupp, you're not  
6 going to argue with counsel, and he -- you know, he  
7 didn't call for a definition of "silicide." Just answer  
8 his questions, okay?

01:32PM

9 This is about the third time I've had to have  
10 this discussion with you. I'm going to expect you to  
11 comply with my directions, all right?

12 THE WITNESS: Yes, sir.

13 THE COURT: All right. Let's go forward.

14 MR. CORDELL: Thank you, your Honor.

01:32PM

15 Q. Let's go to your 2004 paper that you also showed us,  
16 PTX-92. And, again, here we're talking about -- we'll  
17 just stay at the title. We're talking about metal  
18 source/drain transistors, right?

19 A. Yes.

01:33PM

20 Q. Now, do you know Dr. Jeffrey Bokor, our expert in  
21 this case?

22 A. Yes, I do.

23 Q. And you think -- you think he's a pretty good  
24 fellow?

01:33PM

25 A. Yes, I do.

1 Q. And are you aware of his work on silicides?

2 A. No.

3 Q. Well, that's something, because if I can go to your  
4 paper -- and let's look at your first reference,

01:33PM 5 Reference Number 2, which is on Page 6. You see right  
6 here that, in fact, you cited one of Dr. Bokor's papers?

7 A. Yes.

8 Q. Okay. So when you cited one of Bokor's papers and,  
9 yet, you weren't aware of his work on silicides, how

01:33PM 10 could that be?

11 A. That's not a yes/no question, right?

12 Q. No, it's not. I'm hazarding an open-ended question,  
13 I admit that.

14 A. So the answer is that I wrote this paper a long time  
01:34PM 15 ago and I would have read that at the time and it's gone  
16 from my memory, that detail.

17 Q. And what about the paper at Reference 6? Would you  
18 have recalled that one? It's another paper from  
19 Dr. Bokor on thin-body silicide source/drain devices,  
01:34PM 20 right?

21 A. Yeah, that paper rings a bell. I knew  
22 Jacob Kedzierski, but I don't remember the details of  
23 that paper after 15 years.

24 Q. The fact is that people of academia cite papers now  
01:34PM 25 and then to recognize other people's work, right?

1 A. That's correct.

2 Q. Doesn't mean you were copying his work, does it?

3 A. It doesn't mean copying, no. It means advancing  
4 work.

01:35PM 5 Q. Right. In fact, what you really want to do is do  
6 something else in your paper, right?

7 A. Hmm?

8 Q. Is that right?

9 A. No.

01:35PM 10 Q. Okay. Well, you testified on direct that your paper  
11 was cited 300 times, right?

12 A. Yes.

13 Q. And just because something is cited in an academic  
14 paper doesn't mean that it's a commercial product, does  
01:35PM 15 it?

16 A. That's correct.

17 Q. In fact, you, at Acorn, never were able to make that  
18 commercial product, correct?

19 A. That's an undefined question. I can't answer it.

01:35PM 20 Q. Okay. Well, I think we already have.

21 So citations to your paper are a way of just  
22 making sure everybody understands what's happening in  
23 the business; is that fair?

24 A. No.

01:35PM 25 Q. Okay. Well, let me put it this way, sir: None of

1 the 300 people that cited your paper took a license  
2 under the patents in this case, correct?

3 MR. HUESTON: Objection. Foundation.

4 THE COURT: Sustained.

01:36PM 5 Q. So let me ask you this, Dr. Grupp: Are you aware of  
6 anyone taking a license under the patents in this case?

7 A. "Aware" is a funny word. I don't know what that  
8 means, in a sense.

9 Q. Well, I'm trying to lay a little foundation. Do you  
01:36PM 10 have knowledge about whether or not any company has  
11 taken a license under the four patents in this case?

12 A. Yes.

13 Q. And what does your knowledge have?

14 A. I do not know of anyone who's taken a license in  
01:36PM 15 this case.

16 Q. And Acorn's had a bunch of meetings with companies,  
17 right?

18 A. Yes.

19 Q. And they have tried to license this, correct?

01:36PM 20 A. Yes, I believe so.

21 Q. And not only has nobody ever taken a license, you've  
22 never even done a co-development agreement with another  
23 company, right?

24 A. No.

01:37PM 25 MR. HUESTON: Objection. Foundation.

1 THE COURT: If he knows, he can answer.

2 Overruled.

3 Q. Has Acorn ever achieved a co-development agreement  
4 with any other company?

01:37PM 5 A. Yes.

6 Q. For the four patents in this case?

7 A. Yes.

8 Q. Okay. Which company?

9 A. It's called ATDF.

01:37PM 10 Q. That's new. But, again, to your knowledge, no  
11 company has taken a license under these four patents,  
12 correct?

13 A. Yes.

14 Q. Okay. Thank you.

01:37PM 15 MR. CORDELL: Nothing further, your Honor.

16 THE COURT: You pass the witness?

17 MR. CORDELL: I do.

18 THE COURT: Is there redirect?

19 MR. HUESTON: Yes, your Honor.

01:37PM 20 THE COURT: All right. Proceed with redirect.

21 MR. HUESTON: Thank your Honor.

22 REDIRECT EXAMINATION

23 BY MR. HUESTON:

01:38PM 24 Q. So, Dr. Grupp, you were just shown one of your  
25 papers. It was from 2004, right?

1 A. Yes.

2 Q. Okay. And that's about 17 years ago?

3 A. Yes.

01:38PM

4 Q. All right. And when you prepared your paper, would  
5 you have read everything before you put them in as  
6 references at that time?

7 A. Yes.

01:38PM

8 Q. Okay. And so when I showed you those Samsung papers  
9 earlier which had your reference, reference to your  
10 invention in it, what was your conclusion?

11 A. I would conclude that they had read my papers.

12 Q. Okay. Now, Samsung's lawyer asked whether you ever  
13 developed a device using a metal oxide. Do you remember  
14 that?

01:38PM

15 A. Yes, I do.

16 Q. Now, to be clear, even though Acorn didn't  
17 manufacture that specific device, did you develop other  
18 prototype devices for your invention?

19 A. Yes.

01:38PM

20 Q. And what kind of results did you achieve with those  
21 prototypes?

22 A. We achieved new, new results that were beyond any  
23 current technology's capability.

01:39PM

24 Q. And so let me ask you: Why didn't you develop a  
25 device using, for instance, titanium oxide?

1 A. Well, we had a limited number of resources, and our  
2 goal was to just make the best thing we could. And we  
3 tried aluminum oxide and it was a little bit beyond the  
4 capabilities of our equipment, so we stuck with silicon  
01:39PM 5 nitride as our primary target first.

6 Q. All right. And let's go put up PTX-1087. This is  
7 one of the Samsung articles Counsel just questioned you  
8 about. Do you see that?

9 A. Yes.

01:39PM 10 Q. Okay. And so he asked you to read one sentence  
11 below the one that you focused on in answer to my  
12 questions. I want to go up a little bit and ask you  
13 about the sentence before that. In fact, this is so  
14 small, I have to put my glasses on. One moment.

01:40PM 15 So starting after Footnote 14: "These scaled  
16 devices" -- let me see if we can get it. A little  
17 higher please. There you are.

18 "These scaled devices incorporating highly  
19 doped semiconductors need to overcome difficulties such  
01:40PM 20 as the fine control in the dopant profile, high leakage  
21 current, and power dissipation caused by a large contact  
22 resistance."

23 And then, "To solve these problems, many  
24 researchers have tried to increase the  $I_{th}$  by alleviating  
01:40PM 25 the Fermi-level pinning effect using thin oxide or

1 nitride films."

2           So I want to ask you, with reference to that  
3 earlier sentence, what do you understand the context of  
4 this to be in reference to the discussion of your  
01:41PM 5 invention?

6           MR. CORDELL: Your Honor, I'm going to object.  
7 This lacks foundation.

8           MR. HUESTON: Your Honor, this is just getting  
9 the complete picture of the sentence after this sentence  
01:41PM 10 as cited.

11           THE COURT: I'll overrule the objection. I'll  
12 allow the witness to answer.

13 A. So what they are describing is that the previous  
14 technology of the heavily doped semiconductors has some  
01:41PM 15 difficulties with it that you have to overcome.

16 Q. And so what did you understand the reference to your  
17 invention to be in that context?

18 A. In that context, it says here, is a way to overcome  
19 it.

01:41PM 20 Q. Great. You can put that down. And let me put up  
21 the other document that Counsel just showed you, PTX-19.  
22 This is the other Samsung paper. And likewise, I want  
23 to go to that third paragraph and read you the earlier  
24 sentence that counsel didn't read: "The current  
01:42PM 25 approach to lower  $R_c$  is to change the carrier flow



1 mechanism to tunneling emission. To increase the  
2 tunneling current, heavily doped silicon was used to  
3 reduce the tunneling barrier width. However, this  
4 method is approaching its limitation because of the  
5 dopant solubility in silicon, short-channel effect, and  
6 dopant profile control. As an alternate option,  
7 metal-insulator-semiconductor structure was presented."

8 Now, with that whole context, Dr. Grupp,  
9 explain to the jury what you understand this discussion  
10 to be.

11 A. So the old approach tried to make the barrier fit  
12 the -- tried to dope more heavily to try and squeeze the  
13 electrons through there, and it was hitting its limit.  
14 And they list the number of reasons why it hits its  
15 limit, and so they are saying, "Hey, here is the better  
16 option. You want to go to  
17 metal-insulator-semiconductor. This seems to be a way  
18 through to a better solution."

19 Q. And that was your invention, right?

20 A. And that was my invention.

21 Q. Now, Counsel pointed out the next sentence about the  
22 lack of thermal stability, and let me ask you about  
23 that.

24 Is a thermal stability common or uncommon  
25 as an issue in the making of semiconductor devices?

1 A. All -- everything in the world has a thermal limit  
2 to it. So depends what you are trying to do, that if  
3 you want to give a particular device that has to go to  
4 some temperature, then you'd have to choose materials  
01:43PM 5 that allow you to go to that temperature.

6 Q. And did you understand this reference to mean that  
7 Samsung engineers were saying your invention didn't  
8 work?

9 A. No. They are saying -- I mean, the invention is how  
01:43PM 10 to do it, right? The invention is that you put an  
11 insulator in there, you get a better result. And they  
12 are saying, you know, in our situation, they are trying  
13 to show that they are doing something useful. And what  
14 they are saying is that, "For our situation, we've come  
01:44PM 15 up with materials that can go meet our needs for  
16 temperature stability."

17 Q. Okay. We can take that down.

18 So earlier you were asked some questions  
19 about Acorn, and when I asked you about Acorn, you  
01:44PM 20 described Acorn as an incubator. So I want to ask you  
21 this: In your experience, do incubators manufacture  
22 devices?

23 A. No.

24 Q. Does Acorn manufacture commercial products?

01:44PM 25 A. No.

1 Q. All right. You were also shown a reference by  
2 Counsel about how people almost a hundred years ago were  
3 identifying the Schottky barrier, right?

4 A. That's correct.

01:44PM 5 Q. Had they solved the Schottky barrier a hundred years  
6 ago?

7 A. No.

8 Q. What did your invention do?

9 A. We solved a way to lower the Schottky barrier that  
01:44PM 10 no one had been able to do before.

11 Q. All right. By the way, you were asked questions  
12 about financial interest. I want to ask you: Are you  
13 being paid to testify today?

14 A. No.

01:45PM 15 Q. Do you stand to get any kind of bonus if, win or  
16 lose, out of this trial?

17 A. No.

18 Q. And you talked earlier about a minuscule amount of  
19 stock in Acorn. Is that having any impact on your  
01:45PM 20 testimony today?

21 A. No.

22 Q. Dr. Grupp, you mentioned earlier that you go into  
23 Google Patents with your name, I think you said, and all  
24 37 of your patents show up, right?

01:45PM 25 A. That's correct.

1 Q. Do all those patents relate to the invention you've  
2 been talking about?

3 A. No.

4 Q. Roughly how many, if you had to estimate?

01:45PM 5 A. I think it's a little more than half.

6 Q. All right. And would that be a reference to patent  
7 family?

8 A. Yes.

9 MR. HUESTON: No more questions, your Honor. I  
01:45PM 10 pass the witness.

11 THE COURT: Additional cross-examination?

12 MR. CORDELL: No, your Honor. Thank you.

13 THE COURT: You may step down, Dr. Grupp.

14 THE WITNESS: Thank you, your Honor.

01:46PM 15 THE COURT: Plaintiff, call your next witness.

16 MR. DIXON: Thank you, your Honor. Acorn calls  
17 Mr. Tom Horgan.

18 THE COURT: Say it again, Mr. Dixon, so I can  
19 hear you.

01:46PM 20 MR. DIXON: Thank you, your Honor. Acorn calls  
21 Mr. Tom Horgan.

22 (Whereupon, the witness was duly sworn.)

23 THE COURT: Please come around; have a seat on  
24 the witness stand.

01:46PM 25 Are there trial binders to distribute?

1 MR. HUESTON: There will be no exhibits in this  
2 exam. So, no, your Honor.

3 THE COURT: All right, counsel. You may  
4 proceed with direct examination.

01:46PM 5 MR. HUESTON: Thank you, your Honor.

6 TOM HORGAN,  
7 having been first duly sworn, testified as follows:

8 DIRECT EXAMINATION

9 BY MR. HUESTON:

01:46PM 10 Q. Good afternoon, Mr. Horgan.

11 A. Good afternoon, Mr. Hueston.

12 Q. Would you please state your full name for the  
13 record.

14 A. Yes. My name is Tom Horgan.

01:47PM 15 Q. Now, I noticed you have an accent. Where are you  
16 from?

17 A. Yes, guilty. I am from Ireland.

18 Q. Can you tell us a little bit about growing up in  
19 Ireland?

01:47PM 20 A. I came from a small town of about 6,000 people. I'm  
21 the eldest of seven. My father was a town doctor there  
22 and my mother was a homemaker, and I met my wife, and  
23 she's one of eleven, and we came to the States 28 years  
24 ago, and we have two children. We have a daughter who  
01:47PM 25 was born here and a son that we adopted eleven years

1 later.

2 Q. Mr. Horgan, do you have any college degrees?

3 A. I do. I have a bachelor's of engineering and a  
4 master's of industrial engineering.

01:47PM 5 Q. All right. Now, you mentioned you had your daughter  
6 here in the United States. How long has your family  
7 been living here in the United States?

8 A. Twenty-eight years.

9 Q. Now, can you provide the jury a brief summary of  
01:48PM 10 your employment history after moving to the  
11 United States?

12 A. Yes. When I came over to the United States, I ran a  
13 service operation for two disc drive companies, and I  
14 became the vice president of global services for those  
01:48PM 15 two disc drive companies.

16 Q. Okay.

17 A. For the second one, I think it was.

18 Q. And did you also work at a company called  
19 Maxwell Technologies?

01:48PM 20 A. I did.

21 Q. And let me ask you just a couple questions about  
22 that. What kind of company is Maxwell Technologies?

23 A. Maxwell Technologies was predominantly in the  
24 defense sector. It was a 30-year-old company. It was  
01:48PM 25 struggling, heading to Chapter 11 bankruptcy at the

1 time.

2 Q. And what was your job title when you first joined  
3 Maxwell Technologies as you were just describing it,  
4 headed towards bankruptcy?

01:48PM 5 A. My job title was vice president of business  
6 development, and I also had a floor seat as part of the  
7 turnaround team.

8 Q. Okay. And, briefly, what did you do as part of that  
9 turnaround effort?

01:49PM 10 A. You know, a turnaround is a difficult thing. So,  
11 briefly, it was to help the businesses become more  
12 efficient that were non-defense, but more importantly,  
13 it was to find the technologies for the future.

14 Q. And can you recall any, in particular, that you  
01:49PM 15 helped Maxwell Technologies help refine and bring?

16 A. Yes. The ultracapacitor.

17 Q. And what did you help do with the ultracapacitor?

18 A. The ultracapacitor, I basically met the inventor,  
19 just one person, and they built some early prototypes,  
01:49PM 20 and I made a business out of it.

21 Q. All right. And did you remain in your role as VP of  
22 business development?

23 A. No. I became CEO of the company.

24 Q. Okay. And does Maxwell Technologies still exist?

01:49PM 25 A. Maxwell Technologies was acquired in 2019 by Tesla

1 for its capacitor technology.

2 Q. And is -- to your knowledge, is it still a  
3 subsidiary of Tesla today?

4 A. Yes, it is.

01:50PM 5 Q. All right. Where did you work after Maxwell  
6 Technologies?

7 A. I came to Acorn Technologies.

8 Q. Roughly, when was that?

9 A. It was September 2000, I believe.

01:50PM 10 Q. And what was the position you had when you came to  
11 Acorn in September of 2000?

12 A. I was hired in as the CEO.

13 Q. And is that the same role you have to do?

14 A. Yes, twenty years later.

01:50PM 15 Q. Now, at a high level, how would you describe Acorn's  
16 business?

17 A. At a high level, the company was founded by  
18 inventors; and inventors, to us, we love inventions and  
19 we love inventors. And so the idea was to find

01:51PM 20 transformative inventions and to bring them to market.  
21 We call the company "Acorn" for a very specific reason.

22 Q. What's that reason?

23 A. You know, we have a lot of investors who are  
24 inventors, too, and we recognize, with transformational  
01:51PM 25 inventions that it's going to take a long time. So the



1 acorn is the seed of the idea, the germ, and you grow it  
2 into a big oak tree over a long time.

3 Q. And then explain to the jury then, well, how is it  
4 that you are nurturing this? What are you doing at  
01:51PM 5 Acorn to nurture this and to try to grow this over time?

6 A. Well, we essentially believe in the inventor, you  
7 know, after a lot of vetting. So we put the inventor  
8 front and center; and by "center," I mean we surround  
9 them with capability to bring their technology to  
01:51PM 10 market. And by "front," I mean that front and center,  
11 that we put the inventor, if they are really good, we  
12 are going to put them in front of the best people in the  
13 world to share their idea, to test their idea.

14 Q. All right. And on a personal level, what is it like  
01:52PM 15 working with inventors? Have you noticed any quirks?

16 A. Yes.

17 Q. Give an example.

18 A. Well, I remember the first time I met Dr. Grupp in  
19 the basement in Stanford, and he was on some mobile  
01:52PM 20 platform whizzing around talking physics.

21 Q. And how about his co-inventor, Daniel Connelly?

22 A. Dr. Connelly is an interesting man. When he talks,  
23 he never looks you in the eye because he is literally in  
24 another place. So it's like listening to a machine gun  
01:52PM 25 talk. It's fast.

1 Q. What areas of technology do Acorn's inventors focus  
2 on?

3 A. We focus on two industries essentially. We focus on  
4 semiconductors and telecommunications. They are, you  
01:52PM 5 know, together, smaller than the oil industry but not  
6 far from it, and they influence all our lives.

7 Q. And are there any -- is there anything specific  
8 about those two industries that attract you, in terms of  
9 looking forward to the future?

01:53PM 10 A. Yes. When you go for a transformational technology,  
11 that means you're solving something way in advance of  
12 its need. So you need some roadmap. And the beautiful  
13 thing about the semiconductor in telecommunications  
14 industry is they have roadmaps that they produce,  
01:53PM 15 looking out 15 or more years. So that helps us give  
16 context to what we're doing.

17 Q. And I was just going to ask you that. How do those  
18 roadmaps that they are making help you focus at Acorn?

19 A. They tell us -- they give us a sense of the problems  
01:53PM 20 to solve and when they are most needed.

21 Q. Can you identify some of the technology -- excuse  
22 me -- some of the technologies that Acorn has developed?

23 A. Yeah. Within the Acorn semiconductor portfolio, we  
24 have three broad classes of technologies. The first is  
01:54PM 25 the lowering the Schottky barrier, which can be used for

1 a lot of things; in this particular case, lowering  
2 contact resistance.

3 We have a second set of technologies which  
4 is -- we call it the varied stressor, but it's all about  
01:54PM 5 straining, pulling the silicon to where the electrons  
6 can flow more, you know, because you get more current  
7 again.

8 And then a third area, it's pretty early, but  
9 it's very interesting: We believe that we can create  
01:54PM 10 light on these wafers and use that as the basis of  
11 computing and not electricity anymore.

12 Q. Let me ask you, what about in the telecommunications  
13 side?

14 A. In the telecommunications side, we've been working  
01:54PM 15 on algorithms that really enhance the way a wireless  
16 device connects to a network, and there's a lot of  
17 things that we can do with that.

18 Q. All right. Now, what happens after an Acorn  
19 inventor develops technology? What's the next step in  
01:55PM 20 Acorn's business model?

21 A. Well, we vet it internally. We vet it internally,  
22 and in some cases, we will bring in world-class  
23 expertise to also vet the technology.

24 Q. Let me just stop you there. Why do you bother to do  
01:55PM 25 that?

1 A. You know, the whole point of inventing, it's  
2 extremely difficult, especially when you're solving the  
3 big problems. So you've got to test your idea  
4 continuously, and that's why we do it: Do we have  
01:55PM 5 something or not?

6 Q. And if this gets through the vetting, then what  
7 happens?

8 A. If it gets through the vetting, obviously we -- I  
9 shouldn't say "obviously." It's just part of the  
01:55PM 10 process. It's fundamental. We patent it.

11 Q. Why do you patent it?

12 A. To protect it. If you don't have a patent, you lose  
13 your idea. Someone else can practice it, take it  
14 without any harm.

01:55PM 15 Q. And how many patents does Acorn currently have on  
16 inventions?

17 A. I think we're approaching certainly almost 200  
18 issued and filed-for patents.

19 Q. Now, what is the next step after Acorn obtains a  
01:56PM 20 patent?

21 A. You know, depends on the technology; but in the  
22 semiconductor space, we build a team, we bring in  
23 expertise to help advance it and also help develop proof  
24 of concept or proof of principle in a context that's  
01:56PM 25 meaningful to the industry.

1 Q. All right. And on the semiconductor side, does  
2 Acorn itself manufacture commercial products?

3 A. No. There are only a handful of companies that can  
4 build semiconductor products. You need tens of millions  
01:56PM 5 of dollars to build a semiconductor facility.

6 Q. All right. But what about on the telecommunications  
7 side; have you, in fact, created commercial products on  
8 that side?

9 A. Yes, we have. We have software products in the  
01:57PM 10 telecommunications field.

11 Q. So, now, focusing on the technology at issue in this  
12 case. Has Acorn made, offered for sale, or sold a  
13 product using the technology at issue in this case?

14 A. No.

01:57PM 15 Q. Okay. Now, as someone with more than 30 years of  
16 experience in this industry, I just want to ask you: Is  
17 it difficult to invent new technology?

18 A. It's extremely difficult and it's a very risky  
19 business.

01:57PM 20 Q. In your experience, how often are new technologies  
21 invented?

22 A. To have a meaningful invention, you know, in my  
23 experience, it's a one-in-a-thousand shot. It's a long  
24 shot.

01:57PM 25 Q. What are some of the factors that make inventing,

1 you know, that breakthrough invention, difficult?

2 A. I think in our case -- and I separate it. I think  
3 in our case, what makes it difficult is you are trying  
4 to solve a problem. In the case, for example, of Grupp  
01:58PM 5 and Connelly, that's almost a hundred years old that  
6 nobody has solved before. So there's an incredible  
7 stroke of genius needed for that.

8 Q. And is it expensive to try to support invention?

9 A. Expensive is relative; but certainly, from the  
01:58PM 10 standpoint of what you have to do to take that acorn to  
11 an oak tree, it's very expensive.

12 Q. Okay. So in light of those challenges, what  
13 motivates you and Acorn to do this kind of work?

14 A. I think there's grit in this. We're pioneering. We  
01:58PM 15 believe in these inventions and we've tested them  
16 ourselves, over and over again internally, and we're  
17 going to see them through.

18 Q. Now, you've been comparing Acorn and growth towards  
19 an oak tree, and you've talked about the years it takes  
01:58PM 20 to do that. Let me ask you, using that same analogy,  
21 what stage is Acorn at now?

22 A. We're beginning to see the first shoots on the tree.

23 Q. And what do you mean by that?

24 A. I mean leaves are growing. We're close to  
01:59PM 25 commercializing telecommunications technologies.

1 Q. And on the telecommunications technologies, what is  
2 that you are referring to?

3 A. So what I'm referring to is a technology that takes  
4 a wireless device and improves positioning to the point  
01:59PM 5 where the cellular network can be the basis for all  
6 positioning, even undermining GPS.

7 Q. And to your knowledge, do any other companies offer  
8 similar technology?

9 A. We've been told by our partners that we are years  
01:59PM 10 ahead of anybody in the space, six to eight years.

11 Q. And has Acorn licensed that technology?

12 A. Yes, we have.

13 Q. And with whom?

14 A. With a French company, it's in Paris, Sequans.

02:00PM 15 Q. And have you initialed any letters of intent with  
16 any companies here?

17 A. Yes. Just recently, I signed a letter of intent  
18 with one of the biggest global wireless carriers.

19 Q. Now, let me ask you with respect to that: How long  
02:00PM 20 did Acorn take to develop that technology? When did it  
21 start?

22 A. I think we first announced the technology in 2010,  
23 and we were developing it for several years before that.

24 Q. Is Acorn working on developing new technology today?

02:00PM 25 A. We continue to all the time.

1 Q. Are you familiar with the company Atomera?

2 A. Yes, I am.

3 Q. And how are you familiar with that?

02:01PM

4 A. On two levels. One of our doctors, Dr. Clifton,  
5 knows the founder of the company very well, and  
6 Dr. Connelly now works for Atomera.

7 Q. All right. I now want to shift to another topic. I  
8 want to ask you about the Acorn inventions and patents  
9 at issue in this case. Who at Acorn developed that

02:01PM

10 technology?

11 A. Dr. Grupp and Dr. Connelly.

12 Q. And when did you first meet Dr. Grupp?

13 A. I first met Dr. Grupp when I joined the company in  
14 late 2000.

02:01PM

15 Q. And what were your impressions of Dr. Grupp?

16 A. Very, very brilliant mind, came extremely well  
17 recommended from two professors; in particular,  
18 Professor Harris who has helped a lot of companies get  
19 established. These are very credible people.

02:01PM

20 Q. And did you try to provide support to Dr. Grupp?

21 A. Yes. We hired Dr. Connelly to support him  
22 originally.

23 Q. All right.

24 A. And I'll just say, on Dr. Connelly, I was

02:02PM

25 particularly impressed by him because he had industry



1 experience. He had come out of Motorola, and the CEO of  
2 Motorola semiconductor told me he was one of their most  
3 talented people.

02:02PM

4 Q. All right. Now, at some point, did you become aware  
5 of Dr. Grupp and Connelly's invention?

6 A. I did.

7 Q. And what was your initial reaction when you first  
8 heard of it?

02:02PM

9 A. I didn't believe it. This was something I remember  
10 studying when I went to university 20 years before,  
11 Schottky barriers and semiconductor physics, and I was  
12 in disbelief initially.

13 Q. So what did you do next?

02:02PM

14 A. Well, I'm not a physicist, so I go and I talk to  
15 people in the company who have skills, and then we  
16 brought in outside people, as well, to help vet it,  
17 essentially.

02:03PM

18 I think the turning point for me was when I  
19 hired Dr. Joe Daniele, who was a senior vice president  
20 of a defense company, and he was also a physicist out of  
21 MIT, and he basically said, "I joined because of this."

22 Q. All right. And did you find the invention to be  
23 exciting?

02:03PM

24 A. I did. I could see that, the potential, yes. Very  
25 exciting.

1 Q. Did Acorn do anything to protect this invention?

2 A. Yes. We applied for patents.

3 Q. Now, is Acorn asserting some of those patents in  
4 this lawsuit?

02:03PM 5 A. Yes, we are.

6 Q. And who owns the patents being asserted in this  
7 case?

8 A. Acorn Semi, LLC.

9 Q. And does the assignment to Acorn Semi, LLC, include  
02:03PM 10 the right to sue or collect for past infringement?

11 A. Yes, it does.

12 Q. And by the way, what is Acorn Semi, LLC?

13 A. It's a fully owned subsidiary of Acorn Technologies,  
14 Inc.

02:03PM 15 Q. And just so the record's clear, who is Acorn Semi,  
16 LLC, asserting the patents against?

17 A. We're asserting them against Samsung Electronics and  
18 their affiliates.

19 Q. Did Samsung ever ask permission to use the asserted  
02:04PM 20 patents?

21 A. No.

22 Q. Did Acorn ever give Samsung permission to use the  
23 asserted patents?

24 A. No.

02:04PM 25 Q. Mr. Horgan, I want to ask you: How do you feel

1 knowing that Samsung has been using Acorn's technology  
2 without its permission?

3 A. First of all -- first of all, I felt justified.  
4 We've been at this a long time. So seeing the  
02:04PM 5 technology in use, there was a sense there; but  
6 ultimately devastation.

7 Q. Why devastation?

8 A. We lost a lot, a lot of years where we could have  
9 been receiving royalties, and we had to say no to a lot  
02:04PM 10 of inventors and other things we wanted to do.

11 Q. Now, in your more than 20 years as a company, I just  
12 want to ask you: Has Acorn ever filed a lawsuit against  
13 any other company, ever?

14 A. We're just not built to do that. We have never  
02:04PM 15 filed a lawsuit in 20 years -- in 22 years of operation.

16 Q. All right. What kind of damages is Acorn seeking  
17 for Samsung's use of the technology?

18 A. We're seeking a reasonable royalty.

19 Q. And are you seeking a particular type of royalty?

02:05PM 20 A. Yes. They call it a running royalty.

21 Q. What is a running royalty?

22 A. A running royalty, it's a very fair agreement to  
23 both parties.

24 Q. Why do you think it's fair, yeah?

02:05PM 25 A. Because, essentially, you pay if you use it, and you

1 don't pay if you -- if you don't use it, you don't pay.

2 Q. Now, are you aware of another type of royalty  
3 agreement, other than running royalty?

4 A. I am, yes.

02:05PM 5 Q. What's that called?

6 A. It's called a lump-sum royalty or a one-time royalty  
7 payment for use of the technology, for as long as they  
8 want to use it, until the patents expire.

9 Q. And why is it that you are not looking for a  
02:05PM 10 lump-sum royalty?

11 A. I mean, it's essentially unfair. It drives to  
12 establish a value that's independent of usage.

13 Q. Now, has Acorn entered into any other running  
14 royalty agreements in its past?

02:06PM 15 A. Yes, we have.

16 Q. And in what area?

17 A. In the telecommunications space with Sequans.

18 Q. And has any other company proposed a royalty  
19 agreement with Acorn?

02:06PM 20 A. Yes.

21 Q. Who?

22 A. Well, we've had Intel propose a type of royalty  
23 agreement to Acorn.

24 Q. And did Acorn enter into an agreement with Intel?

02:06PM 25 A. No, we did not.

1 Q. Why not?

2 A. They were pushing us towards a lump-sum royalty, and  
3 we said no.

02:06PM

4 Q. Well, let me ask you, are you out there just trying  
5 to sell your patents at any price for any kind of  
6 royalty?

7 A. No. We're in it to see it in use in everybody's  
8 pocket, essentially, in technology, and we expect a  
9 reasonable royalty for that.

02:07PM

10 Q. All right. Now, has Acorn licensed any of the  
11 asserted patents in this case?

12 A. No, we have not.

13 Q. And when did Acorn start making efforts to license  
14 the asserted patents? What was the time period?

02:07PM

15 A. I believe it was between 2009 and 2012.

16 Q. And at a high level, what was happening during that  
17 time?

02:07PM

18 A. We had come out of the Great Recession, where our  
19 plans had to change, and we were essentially looking for  
20 a semiconductor partner to work with, to bring our  
21 portfolio to market.

22 Q. And when you say "portfolio," what are you referring  
23 to?

02:07PM

24 A. I'm referring to our complete semiconductor  
25 portfolio at that time.

1 Q. Okay. And what portion of that complete portfolio  
2 was the asserted patents in this case?

3 A. At that time, they were a very small piece of the  
4 portfolio.

02:08PM 5 Q. Okay. And were these -- well, let me ask you: What  
6 companies did Acorn have those initial discussions with  
7 about Acorn's entire portfolio?

8 A. There were several. There were several --

9 Q. Can you remember some?

02:08PM 10 A. I'm trying to. We had -- yes. There were the  
11 foundry companies. So there were only a handful of  
12 foundry companies in the world that make advanced  
13 semiconductors; so we approached three of them, TSMC,  
14 UMC -- they're both in Taiwan -- and GlobalFoundries,  
02:08PM 15 which is based here in the U.S.

16 And we also approached Soitec, which builds  
17 wafers for the industry, and we approached Freescale,  
18 which was formerly known as Motorola Semiconductor, and  
19 I think the other one was Applied Materials, which was a  
02:09PM 20 tool producer to the semiconductor industry.

21 Q. Okay. And why did Acorn not form an agreement with  
22 those companies?

23 A. At this time, we were just in exploratory meetings  
24 and were looking for that right partner. And in some of  
02:09PM 25 the cases, in Freescale, for example, they were not

1 going to be in the business of doing advancements. They  
2 weren't one of those five, you know, that came to be, as  
3 it were.

4 And in other cases, tool companies, other  
02:09PM 5 companies that supply tools to the industry, it's just  
6 not a good fit.

7 Q. And again, were you just trying to find any fit you  
8 could?

9 A. No. We knew what we were looking for. We knew  
02:09PM 10 that, again, the expectation was our technologies will  
11 take a long time, and we want to work with a company  
12 that we can trust and we want to work with a company  
13 where we had access to the senior management, right up  
14 to the CEO and the chief technology officer.

02:10PM 15 Q. Now, did any of those companies express interest in  
16 working with you?

17 A. Yes.

18 Q. Which ones?

19 A. You know, in terms of interest, we could argue all  
02:10PM 20 of them did. But specifically, to a more detailed level  
21 of interest, the three foundry companies, TSMC, UMC, and  
22 GlobalFoundries, and Soitec.

23 Q. All right. Well, let me ask you first about TSMC  
24 and UMC. Did you form a relationship with those two  
02:10PM 25 companies?

1 A. Each company, you know, for example, TSMC, we --  
2 they asked us to have a relationship where they would  
3 fund research in our company and share the IP, and we  
4 said no to that.

02:10PM 5 Q. You didn't want to do that?

6 A. No.

7 Q. What about UMC?

8 A. UMC, in the area they were interested in our  
9 portfolio, we found that their process technology just  
02:11PM 10 wasn't mature enough to work with that.

11 Q. So it was your choice, then?

12 A. Yes.

13 Q. You moved on?

14 A. Yes.

02:11PM 15 Q. So now I want to focus on the specific technology at  
16 issue in this case. You've discussed how Acorn  
17 developed that technology starting back in 2001. Why is  
18 it that you've described not even starting to focus on  
19 licensing the technology into much later, like 2009 to  
02:11PM 20 '12?

21 A. From my point of view of contact resistance, as you  
22 scale transistors smaller, it didn't become a real  
23 problem until FinFET came along --

24 Q. When is that?

02:11PM 25 A. -- in terms of the performance impact.



1                   The first FinFET that was announced by  
2 Intel in 2011, I believe.

3 Q.    Okay.   And then who did Acorn try to license  
4 technology to once contact resistance was becoming, you  
02:12PM 5 know, a new issue in the era of these FinFETs?

6 A.    We had a -- at that time, when it became an issue  
7 and was of interest, we were working with  
8 Global Foundries on other technologies in our portfolio;  
9 and so essentially, GlobalFoundries asked us about that  
02:12PM 10 particular technology.

11 Q.    And why was Acorn focused on GlobalFoundries?

12 A.    We liked the fit.   They were good people.   We had  
13 access to the chief technology officer and his team, and  
14 they were already working on another technology in the  
02:12PM 15 company.

16 Q.    All right.   And what was GlobalFoundries' reaction  
17 to hearing about Acorn's technology?

18 A.    They were very interested.

19 Q.    Now, how many meetings do you recall, roughly, that  
02:12PM 20 Acorn had with GlobalFoundries?

21 A.    I don't recall how many, but we had a lot of  
22 meetings with GlobalFoundries.

23 Q.    All right.   And then in connection with those  
24 discussions with them, did they ever suggest to you that  
02:12PM 25 you should meet with other companies?

1 A. Yes. Specifically, they asked us to meet with IMEC,  
2 which was a government and industry-funded research  
3 group in Belgium; and there was another company they had  
4 just entered into a relationship with called  
02:13PM 5 Intermolecular.

6 Q. Okay. And why were they, to your understanding,  
7 asking you to meet with them?

8 A. They were asking us to work with them, with these  
9 particular companies, to look at putting our

02:13PM 10 contact-resistance lowering, the contact resistance  
11 technology into a module for the FinFET process.

12 Q. Okay. And so what kind of Global Foundry device  
13 then, just to be clear, were you discussing using that  
14 Acorn technology in?

02:13PM 15 A. We were discussing all of their FinFET products. In  
16 the short-term, it was the 14-nanometer, which was at  
17 that time they were working on, as well as their  
18 next-generation FinFET products.

19 Q. And -- sorry. And then what happened next?

02:14PM 20 A. Well, it's a sequence of events.

21 Q. What happened -- let me be more precise. What  
22 happened next in the discussions with the 14-nanometer  
23 FinFET?

24 A. So GlobalFoundries actually had been reviewing our  
02:14PM 25 work with IMEC in terms of the proposals, and they

1 basically said that they wanted us to stop working with  
2 IMEC and work directly with them; and that was around  
3 the end of 2013.

02:14PM

4 Q. Did GlobalFoundries eventually take a license to  
5 Samsung's 14-nanometer FinFET?

6 A. Yes, they did.

7 Q. And did discussions suspend or stop around that?

02:14PM

8 A. Well, obviously the immediate 14-nanometer  
9 discussions didn't continue. That was April, I think,  
10 of 2014. There were still some discussions for their  
11 next-generation FinFETs after that.

12 Q. Okay. I was going to ask about that.

02:15PM

13 Is Acorn currently having discussions with  
14 any semiconductor manufacturers about the patented  
15 inventions at suit here?

16 A. With Global Found -- I'm sorry. Could you repeat  
17 the question, please?

02:15PM

18 Q. Sure. Have you been having discussions with any  
19 semiconductor manufacturers about the patented  
20 invention?

21 A. We always continue to have discussions with  
22 companies; and in GlobalFoundries' case, they got out of  
23 FinFET and were dependent on that license, so the  
24 discussions shut down.

02:15PM

25 Q. What about with Soitec?

1 A. With Soitec, we are working with them on a different  
2 technology now.

3 Q. And what is the status of the discussions with  
4 Soitec?

02:15PM

5 A. We've just actually started to work on a three-way  
6 collaboration between ourselves, Soitec, and another  
7 research center in Belgium.

02:16PM

8 Q. And just so I'm clear. When you reference  
9 GlobalFoundries, are you continuing to have discussions  
10 with them other than the ones they are licensing from  
11 Samsung?

12 A. Yes, we do.

02:16PM

13 Q. Okay. Now, we talked about several companies that  
14 Acorn met with to potentially use the technology at  
15 issue in this case.

16 How is Samsung different?

17 A. Samsung didn't take a license and they're  
18 infringing.

02:16PM

19 Q. Has Acorn received any compensation at all from  
20 Samsung for that use of Acorn's technology?

21 A. No.

22 Q. And please remind the jury, what is Acorn asking for  
23 in this case?

02:16PM

24 A. We're asking for a reasonable royalty for use of our  
25 technology.

1 MR. HUESTON: Thank you, your Honor. We pass  
2 the witness.

3 THE COURT: All right. Ladies and gentlemen,  
4 there's a matter I need to take up with counsel very  
02:16PM 5 briefly before we proceed with cross-examination. I'm  
6 going to ask you to retire to the jury room. You will  
7 only be there a short period of time. You can leave  
8 your notebooks closed in your chairs. Don't discuss  
9 anything about the case, and I'll have you back here in  
02:17PM 10 just a minute or less, but I need to take something up  
11 with you in the jury room.

12 The jury should excuse themselves to the jury  
13 room.

14 (Whereupon, the jurors exit the courtroom.)

02:17PM 15 THE COURT: Be seated, please.

16 Mr. Hueston, I know you were not at the  
17 pretrial conference, but the Court entered an order  
18 limiting, at plaintiff's request, precluding any  
19 assertions that Acorn hasn't asserted its patents  
02:17PM 20 against others, and you blew right through the middle of  
21 that with your direct examination.

22 In my opinion, that issue is not only the  
23 door's not open; the door's off the hinges. And I feel,  
24 since it is an order of the Court, I'm obligated to make  
02:18PM 25 defense counsel aware of that as they proceed with

1 cross-examination.

2 So I will not sustain any objections that  
3 Defendants are violating Plaintiff's MIL Number 2 if  
4 they inquire as to the circumstances regarding Acorn not  
02:18PM 5 asserting its patents against other parties.

6 Understood?

7 MR. HUESTON: Yes. I apologize, your Honor.  
8 Understood.

9 THE COURT: All right. Let's bring the jury  
02:18PM 10 back in.

11 (Whereupon, jurors return to the courtroom.)

12 THE COURT: Thank you, ladies and gentlemen.  
13 Please have a seat. We'll proceed with  
14 cross-examination of Mr. Horgan by the Defendants. You  
02:19PM 15 may distribute binders to the witnesses.

16 MR. FOWLER: May I proceed, your Honor?

17 THE COURT: You may proceed, Mr. Fowler.

18 CROSS-EXAMINATION

19 BY MR. FOWLER:

02:19PM 20 Q. Good afternoon. My name is Mark Fowler, and I  
21 represent Samsung. Good to meet you.

22 A. The same to you, Mr. Fowler.

23 Q. Now, Acorn sued Samsung back in late 2019; is that  
24 correct?

02:19PM 25 A. That's correct, I believe.

1 Q. And as CEO of Acorn, you authorized that decision,  
2 didn't you?

3 A. Yes.

4 Q. Now before that time, before Acorn sued Samsung back  
02:20PM 5 in 2019, Acorn never reached out to Samsung by letter,  
6 e-mail, call, meeting to advise Samsung that it had --  
7 the patents that it's suing Samsung for infringing in  
8 this trial, right?

9 A. That's correct.

02:20PM 10 Q. As a matter of fact, Acorn never reached out to  
11 Samsung to talk about a co-development agreement,  
12 either, right?

13 A. Correct.

14 Q. And just to correct one thing, or to make it clear  
02:20PM 15 for the jury, you said during your examination that  
16 there were three foundries: TSMC, UMC, and  
17 GlobalFoundries, three large foundries.

18 Didn't you leave one off the list? Isn't  
19 there another big foundry that you didn't mention?

02:20PM 20 A. I would argue in 2009 to 2012 that Samsung wasn't  
21 necessarily a foundry.

22 Q. It's considered one of the big four now, right?

23 A. It is today, indeed.

24 Q. Okay.

02:20PM 25 THE COURT: Let's make sure we talk one at a

1 time, gentlemen.

2 THE WITNESS: Thank you.

3 THE COURT: Please, continue.

02:21PM

4 Q. At that time, though, a foundry you didn't reach out  
5 to is Samsung, and you didn't do that between 2015 and  
6 2019, right?

7 A. Yes.

02:21PM

8 Q. Now, Samsung started selling the products that  
9 Acorn's accusing of infringing in this trial back in  
10 2015, right?

11 A. I believe so.

12 Q. And you knew that? You knew Samsung was selling  
13 these 14-nanometer FinFET products back in 2015, right?

14 A. Yes, we knew they were selling them, yes.

02:21PM

15 Q. And you knew they were selling them in 2016, 2017,  
16 2018, the first part of 2019, right?

17 A. Yes.

18 Q. But you didn't sue Samsung then, right?

19 A. That's correct.

02:21PM

20 Q. And you didn't send them a letter that said, "Hey,  
21 we think you're infringing our patents," right?

22 A. That's correct.

23 Q. You just sued them five years after they started  
24 selling the products without any kind of advance

02:21PM

25 warning; is that correct?



1 A. That's correct.

2 Q. Now, I think, as you mentioned, you were -- you've  
3 been the CEO of Acorn since 2000; is that right?

4 A. Yes.

02:22PM 5 Q. But the Plaintiff in this case is something called  
6 Acorn Semi; is that right?

7 A. That's right.

8 Q. When was that founded?

9 A. I believe Acorn Semi was founded sometime in 2019.

02:22PM 10 Q. Right. And it has three employees; is that right?

11 A. I believe so, yes.

12 Q. Okay. And it's the one that's suing in this  
13 courtroom today, right?

14 A. Yes.

02:22PM 15 Q. Okay. Now, the thing you've been the CEO of since  
16 2000-something called Acorn Technologies, that's a  
17 separate company, right?

18 A. It's not separate.

19 Q. It's the parent of Acorn Semi?

02:22PM 20 A. Correct.

21 Q. Okay. Now, you gave a bunch of testimony today  
22 about Schottky barrier and contact resistance and  
23 whatnot; but you're not an expert in the field of  
24 semiconductor technology, right?

02:22PM 25 A. I think that's fair.

1 Q. And, in fact, you've never, in your entire long  
2 career, worked in the semiconductor --

3 A. I did --

4 Q. -- technology field, right?

02:22PM 5 A. I did work for Digital Equipment Corporation. They  
6 were in the semiconductor business.

7 Q. Well, let's look at your testimony, Mr. Horgan --  
8 well, first of all, you gave a deposition in this case,  
9 too, didn't you?

02:23PM 10 A. I did, of course, yes.

11 Q. And it was just back in last November, I believe; is  
12 that right?

13 A. Yes.

14 Q. And you swore to tell the truth, didn't you?

02:23PM 15 A. Yes.

16 Q. So let's look at your testimony, if we could just  
17 pull it up. We can just look at the paper at 169, 15  
18 through 19. If we could blow that up.

19 And you were asked this question: "What are  
02:23PM 20 Acorn's contact technologies?"

21 Answer: "They're based on -- on the -- again,  
22 I am not a semiconductor expert and I have never worked  
23 in the industry, but I believe that it's to do with  
24 metal contacts in silicon chips."

02:23PM 25 Now, that's a question you were asked and

1 that's the answer you gave at the time, right?

2 A. Yes.

3 Q. Now, that's as much as you were able to tell us back  
4 in November about what Mr. Grupp and Mr. -- or Dr. Grupp  
02:24PM 5 and Dr. Connelly's contact technology was about, right,  
6 that it was something to do with metal contacts in  
7 silicon chips; is that right?

8 A. That's what I said, yes.

9 Q. You weren't able to elaborate back in November like  
02:24PM 10 you did today about the technologies, right?

11 A. I don't believe I was asked to elaborate.

12 Q. So if we wanted to talk to a current employee of  
13 Acorn Semi who could tell us about contact technologies,  
14 would that be Mr. Clifton?

02:24PM 15 A. Dr. Clifton, yes.

16 Q. Dr. Clifton? Dr. Clifton's the vice president of  
17 semiconductor technologies for Acorn Semi, right?

18 A. That's correct.

19 Q. So if the jury wants to hear something from a  
02:24PM 20 current Acorn employee about contact technologies,  
21 that's the person they would want to hear from; is that  
22 right?

23 A. He's one of them, yes.

24 Q. Okay. So you testified that Acorn doesn't make any  
02:25PM 25 products, and had said it goes out to companies to try

1 to promote the products; is that right?

2 A. Yes.

3 Q. And so for many years, Acorn has gone out and  
4 attempted to obtain a joint development agreement with a  
02:25PM 5 large semiconductor company or someone in the industry  
6 in order to get into the market or license your  
7 technology; is that right?

8 A. Yes.

9 Q. Okay. And the companies that you have met with have  
02:25PM 10 included, if I've got the list right -- I wrote them  
11 down here -- Texas Instruments, Freescale,  
12 GlobalFoundries, TSMC, Applied Materials, UMC,  
13 Intermolecular, Soitec, IMC; is that right? Did I get  
14 the list right?

02:25PM 15 A. That sounds right.

16 Q. And each of those companies is either a  
17 semiconductor manufacturer or somehow involved in the  
18 industry in making wafers or equipment for semiconductor  
19 products; is that right?

02:26PM 20 A. I think there's an additional category there.

21 Q. Which is?

22 A. Which is government-funded, industry-funded research  
23 center.

24 Q. Now, it's fair to say that those nine companies are  
02:26PM 25 all large companies; is that right?

1 A. No.

2 Q. Well, let me put it this way: How about  
3 Texas Instruments, Freescale, GlobalFoundries, TSMC,  
4 Applied Materials; those are all very large companies,  
02:26PM 5 right?

6 A. Yes, they are.

7 Q. And you tried hard to work with them to obtain a  
8 co-development agreement and to license your patents  
9 with them; is that right?

02:26PM 10 A. I don't understand the question.

11 Q. Well, did you -- when you went and visited them, you  
12 were trying to get, in each case, either a  
13 co-development agreement or a license agreement; is that  
14 right?

02:26PM 15 A. In some cases, we were just introducing the company  
16 to the other company to see if there was any basis for a  
17 discussion along those lines.

18 Q. Well, let's take a quick look, if we could, at  
19 DTX-42. Let's put that up on the screen right now.

02:27PM 20 Now, you understand, sir, that during the  
21 course of this case, Samsung asked Acorn some written  
22 questions that Acorn was responding -- had responded  
23 under oath in terms of answering the questions; is that  
24 right?

02:27PM 25 A. I do, yes.

1 Q. Okay. So let's turn to Page 50 in DTX-42 --  
2 actually, let's start at Page 49. And I'm showing you  
3 one of these questions and answers. And before we go  
4 any further, do you understand that this was a response  
02:27PM 5 that Acorn provided in just last October; is that right?  
6 I can refresh your memory, if you don't remember.

7 A. Are we talking about the interrogatory?

8 Q. Yes.

9 A. I don't recall when that was submitted.

02:28PM 10 Q. Well, let's go to the very last page, 71. And do  
11 you see there that you served your response back in  
12 October of 2020?

13 A. Yes.

14 Q. And so as of October of 2020, your answer was full  
02:28PM 15 and complete, right?

16 A. That was the document we submitted in October 2020.

17 Q. Well, it was full and complete, your answer at that  
18 time, right?

19 A. I assume so.

02:28PM 20 Q. Well, you're the CEO of the company. Didn't you  
21 want to make sure that your answers in this case were  
22 full and complete?

23 A. Yes. To the best of our ability, yes.

24 Q. And you went on most of these meetings yourself,  
02:28PM 25 right? You met with most of these companies, along with

1 Mr. Clifton, right?

2 A. I went to most of them, not all.

3 Q. Okay. So let's go back to Page 49, if we could,  
4 just to see what the question is. So the question --  
02:28PM 5 it's a long question. It's a lawyer's question.

6 "Identify all communications between Acorn and  
7 any other person or entity regarding actual or potential  
8 infringement, licensing, assignment, damages and/or  
9 royalties (potential or actual) with respect to the  
02:29PM 10 asserted patents or related patents." And let me stop  
11 there.

12 Do you understand the "asserted patents," those  
13 are the four patents we're talking about in this trial,  
14 right?

02:29PM 15 A. Yes.

16 Q. Okay. "Including the identity of each person or  
17 entity involved, the dates of each such communication,  
18 the products at issue, the patents and patent claims at  
19 issue, any resulting royalty rates, damages or other  
02:29PM 20 terms, and the outcome, result and/or status of such  
21 communications."

22 Do you see that?

23 A. I do.

24 Q. Now let's start on Page 50. Now, there's some  
02:29PM 25 objections at the start, and let's go to the first full

1 paragraph that starts, "Over the years."

2 Now, there, you, Acorn, responded, "Over the  
3 years, Acorn has had discussions with several developers  
4 and manufacturers of semiconductor devices concerning  
02:29PM 5 potential co-development and/or licensing relating to  
6 the technology claimed in Acorn's asserted patents."

7 That's correct, right?

8 A. That's correct.

9 Q. And what we're talking about here, just to be clear,  
02:30PM 10 is not just, "Hi, I'm introducing myself"; this is about  
11 co-development and/or licensing, right?

12 A. It's where we're -- in some cases, it's where we're  
13 starting our relationship and we're showing that  
14 technology is part of our portfolio.

02:30PM 15 Q. So let's go through these one by one very quickly.  
16 So the first paragraph we have is you, in December of  
17 2005, met with Texas Instruments, right?

18 A. Yes. In Cleveland, yes.

19 Q. And the result of that, as we saw at the bottom, is  
02:30PM 20 no co-development or licensing agreement was reached  
21 with Texas Instruments, right?

22 A. Correct.

23 Q. And that was it. You had no further success with  
24 Texas Instruments since 2005, right?

02:30PM 25 A. We had a breakfast meeting at Denny's and introduced



1 the two companies.

2 Q. Let's go to the next page, if we could. Now, at the  
3 top of this -- I'm not going to go through the full  
4 answer -- it says, "On or around February 24, 2009,  
02:31PM 5 there was a meeting with Applied Materials and some  
6 members of Acorn."

7 And then down below, it talks about another  
8 meeting in February 8, 2017, again, with  
9 Applied Materials.

02:31PM 10 If we could go down a little bit further,  
11 please.

12 Ultimately -- it says, "Ultimately, no  
13 co-development or licensing agreement was reached with  
14 Applied Materials or Applied Ventures."

02:31PM 15 So for at least, it looks like, a period of  
16 eight years, or it spans eight years, there were  
17 communications with Applied Materials, and you were  
18 unable to have a co-development or licensing agreement  
19 with Applied Materials during that period of time; is  
02:31PM 20 that right?

21 A. That's correct.

22 Q. Okay. Without belaboring the rest of this, you also  
23 met, from 2009 onward, with GlobalFoundries, with  
24 Freescale, TSMC, UMC, Intermolecular, Soitec, and IMC,  
02:32PM 25 and in each of those cases, the end result was no

1 co-development or licensing agreement was reached with  
2 that company, correct?

3 A. Not at this time.

02:32PM 4 Q. Well, let's talk about "not at this time." I think  
5 we heard Dr. Grupp say that he had his invention moment  
6 back in -- it was either 2001 or 2002, right?

7 A. Yes.

02:32PM 8 Q. Okay. So we're now talking about 20 years, and you  
9 haven't been able to get anybody in the world to license  
10 any of these patents, right?

11 A. That's correct.

12 Q. That's an indication that nobody needs the patents,  
13 right?

14 A. I disagree.

02:32PM 15 Q. Well, nobody seems to want to pay any money for  
16 them; is that right?

17 A. Certainly, that's true. Nobody wants to pay money  
18 for using our technology.

02:32PM 19 Q. Well, are you saying that other people are using  
20 your technology?

21 A. No. I'm talking about Samsung.

22 Q. Okay. Is anyone else in the world using your  
23 technology, sir?

24 A. Any -- anyone else?

02:33PM 25 Q. Yeah. Anyone else in the world besides Samsung?

1 Does anyone else use this technology, other than what  
2 you allege Samsung does?

3 A. I don't know at this time.

4 Q. Haven't you looked into it?

02:33PM 5 A. We've looked into it, but we haven't made final  
6 determinations yet.

7 Q. Well, have you made any determinations, sir?

8 MR. HUESTON: I'm going to -- your Honor, I  
9 just want to object to the extent this may call for  
02:33PM 10 attorney-client privilege communications. If you can  
11 answer without referencing that.

12 THE COURT: To the extent the inquiry asks for  
13 communications with counsel, you can raise it at that  
14 time. I assume Mr. Horgan knows not to volunteer  
02:33PM 15 communications with counsel.

16 Let's proceed.

17 MR. FOWLER: Should I reask the question, your  
18 Honor?

19 THE COURT: That's up to you, counsel.

02:33PM 20 MR. FOWLER: Thank you.

21 Q. So, Mr. Horgan, have you reached any, even  
22 preliminary determinations, as to whether any company,  
23 anywhere in the world, is using the supposedly  
24 breakthrough invention of Dr. Grupp and Dr. Connelly,  
02:34PM 25 other than your allegations against Samsung?

1 A. I cannot divulge information. That's under  
2 attorney-client privilege.

3 Q. Well, have you sued anyone other than Samsung for  
4 infringement?

02:34PM

5 A. No.

6 Q. Have you sent any letters to anyone saying, "Hey,  
7 you're infringing our patents"?

8 A. No.

02:34PM

9 Q. Have you even told anyone, even on the phone or in a  
10 meeting, "Hey, you better watch out. We think you're  
11 using our patents"?

12 A. No.

02:34PM

13 Q. So let's go back and look at one specific example  
14 of -- before we do that, I take it, as a result of the  
15 fact that you haven't licensed any of these patents, you  
16 haven't generated any revenue off of any of these four  
17 patents to date; is that correct?

18 A. That's correct.

02:35PM

19 Q. Okay. So let's look at one specific example of  
20 meetings that you had with Applied Materials.

21 MR. FOWLER: If we could bring up DTX-62,  
22 please.

02:35PM

23 Q. Now, this has got -- it's a string of e-mails, but  
24 let's focus initially at the very top. First of all,  
25 this is an e-mail from you to Mr. Clifton. And forgive

1 me. I don't know how to pronounce his name. Is it  
2 Mr. Goebel?

3 A. Goebel.

02:35PM

4 Q. Goebel. I hit it. So -- and just for the jury's  
5 benefit, Mr. Clifton is the vice president of  
6 semiconductor technologies at Acorn?

7 A. Dr. Clifton, yes.

8 Q. Dr. Clifton. And is it Dr. Goebel?

9 A. Yes.

02:35PM

10 Q. And Dr. Goebel is who?

11 A. Dr. Andreas Goebel, who is also working at  
12 Acorn Semi, LLC.

13 Q. Okay. Now, those are the three employees at Acorn  
14 Semi, LLC, right, just the three of you?

02:36PM

15 A. Actually, it's both Dr. Clifton and Dr. Goebel. I'm  
16 CEO of Acorn Technology. So --

17 Q. Okay. I'm sorry. Two employees plus the CEO?

18 A. That's correct.

19 Q. That's the full makeup of Acorn Semi?

02:36PM

20 A. Today, yes.

21 Q. Okay. And it's the three of you that go out and  
22 meet with companies to try to talk to them, to try to  
23 convince them to do a co-development agreement or  
24 license agreement; is that right?

02:36PM

25 A. No.

1 Q. Okay. Is it Mr. Clifton and Mr. Goebel that are  
2 appointed to do that?

3 A. It's Dr. Clifton and Dr. Goebel.

02:36PM

4 Q. Forgive me. So let's start with this. So this  
5 particular e-mail string has to do with a meeting that  
6 Dr. Clifton had with Applied Materials; is that right?

7 A. That's correct.

02:36PM

8 Q. Okay. So before we address the rest of your e-mail,  
9 let's go to the e-mail below that, and we can just --  
10 that's fine. Just leave it there.

11 So this is an e-mail from Dr. Clifton to you,  
12 February of 2017, reporting on this meeting with  
13 Applied Materials; is that correct.

14 A. That's correct.

02:36PM

15 Q. Okay. Let's look at the beginning of that. He told  
16 you, "We learnt" -- and then there's something redacted  
17 there -- "much of it surprising and mostly not good news  
18 for MIS contact prospects."

02:37PM

19 Now, MIS stands for  
20 metal-insulator-semiconductor, right?

21 A. On silicon.

22 Q. On silicon. And that's the technology that we're  
23 talking about in this courtroom, correct?

24 A. Just to be correct, it's metal insulator on silicon.

02:37PM

25 Q. And that MIS contact technology, that's what we're

1 asking the jury to look at in this trial; is that  
2 correct?

3 A. That's correct.

02:37PM 4 Q. And so Mr. -- or Dr. Clifton is telling you that he  
5 has mostly not good news for you from his meeting with  
6 Applied Materials, right?

7 A. That's -- sorry. What's the question again, please,  
8 Mr. Fowler?

02:37PM 9 Q. Dr. Clifton is telling you that he has mostly not  
10 good news for you about your MIS contact prospects. Is  
11 that --

12 A. Yes, he does say that.

13 Q. Okay. So let's go --

02:37PM 14 THE COURT: I'm going to ask both of you one  
15 more time to make sure the other one has stopped talking  
16 before you begin talking. The court reporter can't take  
17 down two people at the same time, and it's very  
18 important that the record be clear here. So I'm going  
19 to insist that you make sure the other one is stopped  
02:38PM 20 before you talk further, all right?

21 THE WITNESS: My apologies --

22 MR. FOWLER: Thank you, your Honor.

23 THE WITNESS: -- your Honor.

24 THE COURT: Let's continue on that basis.

02:38PM 25 Q. So, Mr. Horgan, here Mr. Clifton says, in the first

1 full paragraph, "As Andreas alluded in his text, the  
2 opportunity for MIS contacts in FinFETs and nanowire  
3 FETs does appear to have gone."

4           FinFETs, that's the type of products that you  
02:38PM 5 are suing Samsung on in this courtroom today?

6 A. That's correct.

7 Q. The next sentence says, "Epi doping and silicide is  
8 just too successful."

9           Epi doping and silicide, that's the technology  
02:38PM 10 Samsung uses, isn't it?

11 A. I don't know, but I'm -- that's what it says.

12 Q. And you understand -- you understood Dr. Clifton to  
13 be comparing MIS on the one hand and epi doping and  
14 silicide on the other hand as two different approaches  
02:39PM 15 to manufacturing FinFETs, right?

16 A. Could you repeat the question, please? Just so --

17 Q. Sure. When you read this --

18 A. Yes.

19 Q. -- and he was telling you about the bad news, you  
02:39PM 20 understood that there were two different ways, at least  
21 two different ways to make FinFETs. One was with MIS  
22 and one was epi doping and silicide, right?

23 A. I would agree with that.

24 Q. And you were here when Dr. Grupp said that putting a  
02:39PM 25 silicide on top of metal doesn't practice the invention.



1 You heard that testimony, right?

2 A. Directly on metal, correct, yes.

3 Q. And then Dr. Clifton goes on to say, "The  
4 universally adopted epi S/D silicide approach has been  
02:40PM 5 advanced so successfully by Applied and the big four  
6 foundries that MIS has no competitive advantage."

7 Do you see that?

8 A. I do.

9 Q. And the big four foundries, I think we went over  
02:40PM 10 this before. The big four foundries that Dr. Clifton is  
11 referring to here includes Samsung, right?

12 A. Yes.

13 Q. So he's telling you that Samsung is using this  
14 epi doping and silicide approach that's different than  
02:40PM 15 MIS, right?

16 A. He's telling me what he has been told in a meeting  
17 by somebody else.

18 Q. By Applied Materials?

19 A. By somebody from Applied Materials.

02:40PM 20 Q. I'd like to focus one other thing on this e-mail  
21 before we go back to your response. In the next  
22 sentence, in the next paragraph, it says, "MIS only has  
23 an opportunity now in contacts to lower doped silicon -  
24 DRAM stands out as a real possibility."

02:41PM 25 Now, you understand that this case is not about

1 DRAM; that's a different kind of semiconductor, right?

2 A. That's right.

3 Q. And what Mr. Clifton -- or Dr. Clifton is saying  
4 here is that your MIS technology's only hope right now

02:41PM 5 is in lower-doped silicon; that's the way you read this,  
6 isn't it?

7 A. I guess I'm a little confused by what it says. It  
8 says, "MIS only has an opportunity now in contacts to  
9 lower doped silicon; therefore, DRAM stands out as a

02:41PM 10 real possibility."

11 Q. You understood this, when you read it, to mean that  
12 really the only area that MIS might be successful in is  
13 in lower-doped silicon; is that right?

14 A. That's how I read that.

02:41PM 15 Q. And you understand, don't you, Mr. Horgan, that  
16 Samsung uses higher-doped silicon, right?

17 A. I don't know what Samsung uses.

18 Q. As a matter of fact, Samsung uses, like, the  
19 highest-doped silicon you can get, right?

02:41PM 20 A. I don't know what Samsung uses.

21 Q. But you sued Samsung anyway?

22 A. Yes.

23 Q. So let's go back up to what your response to  
24 Dr. Clifton was. Your first comment was, "Very

02:42PM 25 comprehensive discussion." So you appreciated all these

1 details Dr. Clifton gave you, right?

2 A. Indeed.

3 Q. But then you told him, "Let's not put anything more  
4 in writing. Let me call you tomorrow to check in before  
5 the board meeting."

02:42PM

6 You were concerned about him putting this kind  
7 of bad news in writing, weren't you?

8 A. No, I wasn't.

9 Q. Well, you certainly told him not to do it anymore,  
10 right?

02:42PM

11 A. I did.

12 Q. And you had a board meeting the next day, didn't  
13 you?

14 A. Yes, I did.

02:42PM

15 Q. And you didn't want to -- anything in writing that  
16 the board might see on this; isn't that right?

17 A. No, not at all.

18 Q. Let me change the subject here a bit. You mentioned  
19 something about a Sequans agreement. Do you recall  
20 that?

02:43PM

21 A. Yes.

22 Q. Now, that Sequans agreement has nothing to do with  
23 the four patents in this case, right?

24 A. That's correct.

02:43PM

25 Q. It's not even had anything to do with semiconductor

1 technology; is that right?

2 A. That's correct.

3 Q. It has something to do with wireless technology,  
4 right?

02:43PM 5 A. Yes.

6 Q. Okay. And you were talking about some fruit on the  
7 tree at Acorn, some recent fruit on the tree, perhaps  
8 something that came out after your interrogatory  
9 response in October; but if I was hearing you correctly,

02:43PM 10 all that fruit on the tree, that's also not in the  
11 semiconductor space, right?

12 A. At this time, that's true.

13 Q. So after, I guess, it's now 21 years of Dr. Clifton  
14 and -- I'm sorry, not Dr. Clifton -- Dr. Connelly and  
02:43PM 15 Dr. Grupp's invention, there hasn't been any fruit on  
16 the tree for Acorn; is that right?

17 A. No.

18 MR. FOWLER: Your Honor, I have no further  
19 questions.

02:44PM 20 THE COURT: Pass the witness?

21 MR. FOWLER: Yes, your Honor.

22 THE COURT: All right. Is there redirect?

23 MR. HUESTON: Yes, your Honor.

02:44PM 24 THE COURT: All right. Let's proceed with  
25 redirect.

1 MR. HUESTON: Thank you.

2 REDIRECT EXAMINATION

3 BY MR. HUESTON:

02:44PM

4 Q. Let's put back the e-mail that was just shown,  
5 please, DTX-62. Mr. Horgan, you were asked a number of  
6 questions about -- let's get it up first. Asked a  
7 number of questions about this document. I want to ask  
8 you a few follow-up ones.

02:44PM

9 Now, in that e-mail from Mr. -- Dr. Clifton,  
10 what did you understand him to be doing here? What was  
11 he describing?

12 A. He's describing the opinions of somebody he met at  
13 Applied Materials.

02:45PM

14 Q. Okay. And just to be clear, did you understand that  
15 Dr. Clifton had these views?

16 A. No.

17 Q. That --

18 THE COURT: Just a minute. Pull that down,  
19 please. That's an unredacted version.

02:45PM

20 MR. HUESTON: I apologize. I thought we had  
21 the right one up. We'll use this one. I apologize,  
22 your Honor.

23 Q. All right. Let's put this up.

02:45PM

24 All right, Mr. Horgan. So, again, to  
25 orient here, that's Dr. Clifton writing below, right?

1 A. Yes, correct.

2 Q. And, again, did you understand what he was saying  
3 there to be his own opinion?

4 A. No.

02:46PM 5 Q. Did you understand this to be Dr. Goebel's opinion?

6 A. No.

7 Q. What was their opinion?

8 A. Their opinion was essentially to -- well, their  
9 opinion isn't captured in this.

02:46PM 10 Q. What's Dr. Clifton's view about the asserted  
11 technology in this case?

12 MR. FOWLER: Objection, your Honor.

13 MR. HUESTON: He's opened the door on this.

14 MR. FOWLER: Dr. Clifton will be here to  
02:46PM 15 testify by deposition.

16 THE COURT: I'll sustain the objection.

17 MR. HUESTON: All right.

18 Q. You were asked above what's -- move this back.  
19 Counsel said, oh, you wrote, "Let's not put anything  
02:46PM 20 more in writing."

21 Mr. Horgan, why did you write that?

22 A. I was sensitive to something else in the document.

23 Q. What was that other thing in the document?

24 A. I believe it was more in the document where we --  
02:47PM 25 where Applied Materials talked about interest in our

1 technology.

2 Q. Okay. I'm going to show you a portion of this  
3 document and put this up. Now, I want you to ignore my  
4 squiggles on this. I want to direct your attention to  
02:47PM 5 this top where it says "DRAM opportunity." Is that the  
6 portion that you were responding to?

7 A. Yes.

8 Q. What is it about that that caused you to say "Let's  
9 not put this in writing"?

02:47PM 10 A. The name, "Samsung."

11 Q. Okay. And I do want to ask you about some of what  
12 was written here, you were responding to. It says in  
13 the first line, "A couple of DRAM manufacturers have an  
14 interest in MIS for contacting access transistors."

02:48PM 15 What did you understand that to mean?

16 A. I understand our technology, people's interest in  
17 our technology, and there's potential other use of the  
18 technology.

19 Q. Okay. And you said there's reference to Samsung.  
02:48PM 20 Is that in the bracketed sentence there at the bottom of  
21 that paragraph?

22 A. Correct.

23 Q. And let's review it. It says, "When I asked,  
24 Chudzik was less knowledgeable of any opportunity in 3D  
02:48PM 25 NAND (flash memory) because there's no standard in 3D

1 NAND. Each manufacturer (Samsung, Intel/Micron,  
2 Sandisk/Toshiba) runs proprietary tech.]"

3 What did you understand that to mean?

02:48PM

4 A. I understood that to mean there was potentially more  
5 infringers on our technology.

6 Q. And what about that language led you to say, "Let's  
7 not put this in writing"?

02:48PM

8 A. We had done something we were reluctant to do  
9 over -- and in 20 years, we have never sued anyone, and  
10 now we had outside counsel advising us that any such  
11 discussions needed to be under attorney-client  
12 privilege. That's why I didn't want any more written  
13 about it.

02:49PM

14 Q. All right. Now, you were asked questions about why  
15 you didn't ask -- go to Samsung or travel to Korea and  
16 ask them for a license, so I want to ask you about that.  
17 Why didn't Acorn just ask Samsung if it wanted a  
18 license?

02:49PM

19 A. Because we had already gone to Korea in the telecom  
20 space.

21 Q. And what happened in that encounter with Samsung?

22 A. It was a uncommunicative meeting and nonresponsive.  
23 We found it very difficult.

02:49PM

24 Q. Did you believe you'd have any more luck just asking  
25 them this time?



1 A. No.

2 Q. All right. Now, Samsung's lawyer just asked you  
3 again about the discussions with several other  
4 companies. You remember that?

02:49PM 5 A. Yes, I do.

6 Q. And just to be clear, did all those discussions that  
7 he referenced, did those all focus on just the  
8 technology at issue in this case?

9 A. No.

02:50PM 10 Q. And, in fact, in each of those meetings, like the  
11 breakfast meeting you mentioned with TI, did Acorn make  
12 a strong effort to license the technology at issue in  
13 this case to all those companies?

14 A. No, we did not.

02:50PM 15 Q. Why not?

16 A. It was a small piece of our portfolio, and interest  
17 at that time was elsewhere on our various stressor  
18 technologies.

02:50PM 19 Q. And, in fact, are you still pursuing discussions  
20 today with some companies --

21 A. Yes.

22 Q. -- on this technology?

23 A. Yes, we are.

24 MR. HUESTON: Pass the witness, your Honor.

02:50PM 25 THE COURT: Further examination, Mr. Fowler?

1 MR. FOWLER: Thank you, your Honor. Very  
2 briefly.

3 If we could bring back up DTX62-2.

4 RECROSS-EXAMINATION

02:50PM

5 BY MR. FOWLER:

6 Q. Now, yes, that's the paragraph we were looking at.

7 You see this thing called "DRAM opportunity"  
8 that you just gave some testimony on?

9 A. Yes, I do.

02:51PM

10 Q. First of all, just to confirm, DRAM is not a  
11 technology that you are accusing of infringement, right?

12 A. Not today.

13 Q. Not today? Not ever so far, right?

14 A. Not ever so far, correct.

02:51PM

15 Q. Okay. If there were a time to do it, it would be  
16 now, wouldn't it?

17 A. I don't know.

18 Q. Okay. Now, you mentioned something about, "Well,  
19 you know, we were lawyered up and so we didn't want to  
20 talk about anything." You sued Samsung in late 2019,  
21 right?

02:51PM

22 A. Yes.

23 Q. Let's go to the first page of this document. The  
24 first page. This e-mail, though, is in 2017. So that  
02:51PM 25 was almost -- well, over two and a half years before you

1 sued Samsung, right?

2 A. That's right.

3 Q. Now, again, you mentioned other folks that you  
4 thought might be potential infringers, but you haven't  
02:52PM 5 told any of them that they might be infringing and you  
6 haven't sued any of them, right?

7 A. That's right.

8 Q. And you also mentioned the visit to Samsung. What  
9 year was that?

02:52PM 10 A. 2013.

11 Q. Okay. And the folks that you met with, they weren't  
12 associated at all with the semiconductor business,  
13 right?

14 A. No, they weren't.

02:52PM 15 Q. Okay. So you've never actually even tried to talk  
16 to anyone in the semiconductor business -- is that  
17 right -- at Samsung?

18 A. That's right.

19 MR. FOWLER: Thank you, your Honor.

02:52PM 20 No further questions.

21 THE COURT: Redirect, further direct?

22 MR. HUESTON: Very briefly. Thank you, your  
23 Honor.

24 REDIRECT EXAMINATION

02:52PM 25 BY MR. HUESTON:

1 Q. Mr. Horgan, just to be clear, in 2017, had you  
2 retained outside counsel to investigate possible  
3 infringement by Samsung?

4 A. Yes, we had.

02:52PM 5 Q. And so that was the time period here on the e-mail,  
6 right?

7 A. That's correct.

8 Q. And that's before you eventually decided to move  
9 forward with the lawsuit, right?

02:52PM 10 A. That's correct.

11 MR. HUESTON: No further questions, your Honor.

12 THE COURT: All right. Additional cross,  
13 Mr. Fowler?

14 MR. FOWLER: No, your Honor.

02:52PM 15 THE COURT: All right. You may step down,  
16 Mr. Horgan.

17 THE WITNESS: Thank you, your Honor.

18 THE COURT: Plaintiff, call your next witness.

19 MR. DIXON: Your Honor, Acorn will now play the  
02:53PM 20 videotaped deposition of six witnesses. The first will  
21 be Samsung engineer Kin-Sang Lam, and this deposition  
22 clip will take just under eight minutes, your Honor.

23 THE COURT: I'd like you to announce each one  
24 just before you play it. Don't give me all of them in a  
02:53PM 25 row.

1 MR. DIXON: All right. Thank you. Your Honor,  
2 as part of this deposition testimony, Acorn will be  
3 introducing Exhibit PTX-874, which is a source code  
4 exhibit; and, therefore, we would request that we seal  
5 the courtroom.

02:53PM

6 THE COURT: All right. Based on Counsel's  
7 request, I'll order the courtroom sealed at this time.  
8 If you are present in the courtroom and not subject to  
9 the protective order that's been entered in this case,  
10 you should exit the courtroom and remain outside until  
11 it's reopened and unsealed.

02:53PM

12 And, Mr. Dixon, this source code material is  
13 only presented through this first deposition witness?

14 MR. DIXON: That is correct, your Honor. For  
15 the next five deposition witnesses, we will not need to  
16 seal the courtroom, so we may unseal as soon as this is  
17 over in 7 minutes and 42 seconds.

02:54PM

18 THE COURT: The courtroom is sealed. Proceed  
19 with this witness by deposition.

02:54PM

20 MR. DIXON: And, your Honor, not to -- sorry to  
21 interrupt. But just to clarify, our Samsung witnesses  
22 may remain? They're not witnesses. They're just  
23 representatives.

24 THE COURT: Is there objection?

02:54PM

25 MR. DIXON: No objection.

1 THE COURT: All right. Let's proceed.

2 (Whereupon, the following portion of the  
3 proceedings is sealed and filed under separate cover as  
4 Sealed Portion Number 1) [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 [REDACTED]

9 [REDACTED]

02:54PM

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

02:55PM

15 [REDACTED]

16 [REDACTED]

17 [REDACTED]

18 [REDACTED]

19 [REDACTED]

02:55PM

20 [REDACTED]

21 [REDACTED]

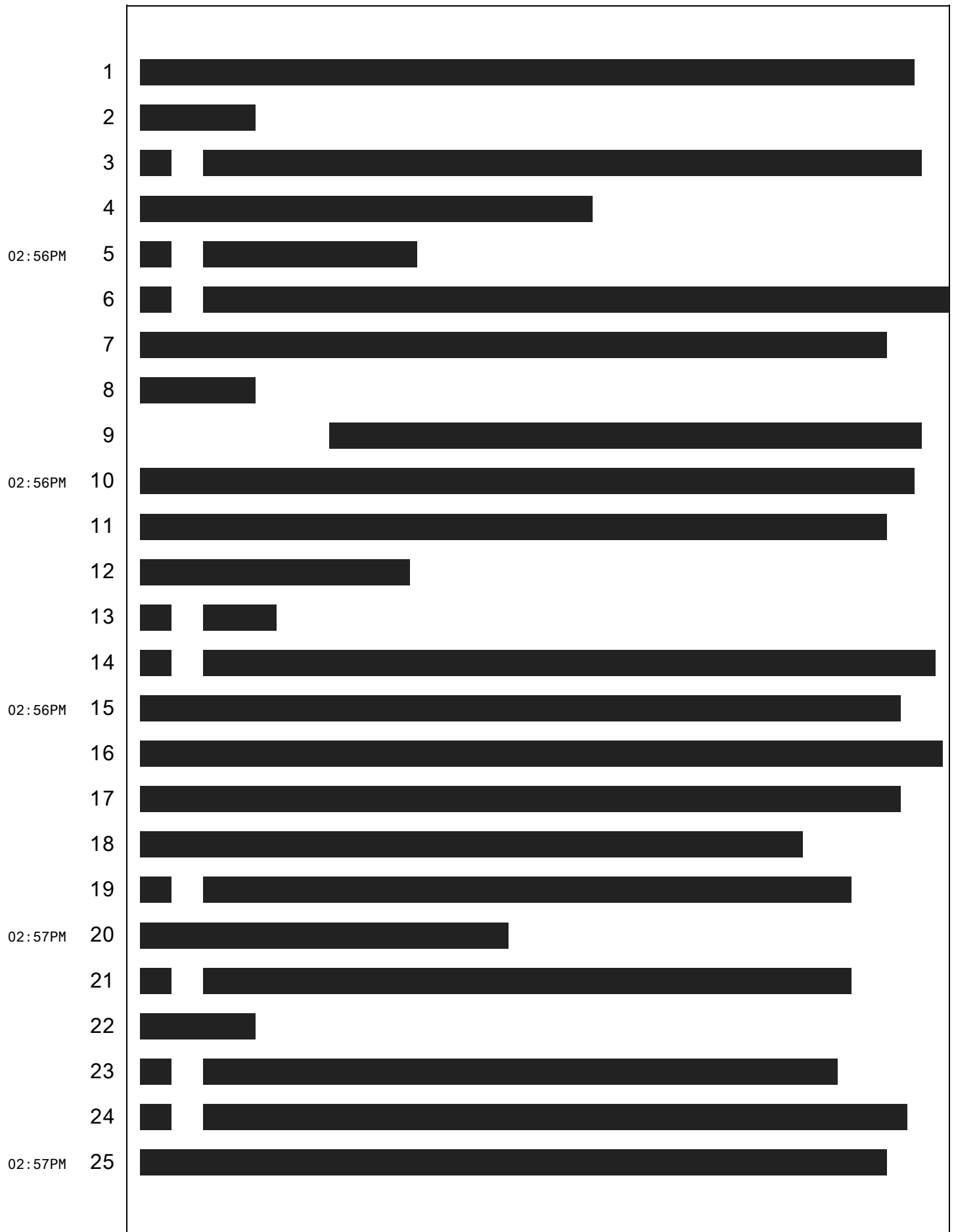
22 [REDACTED]

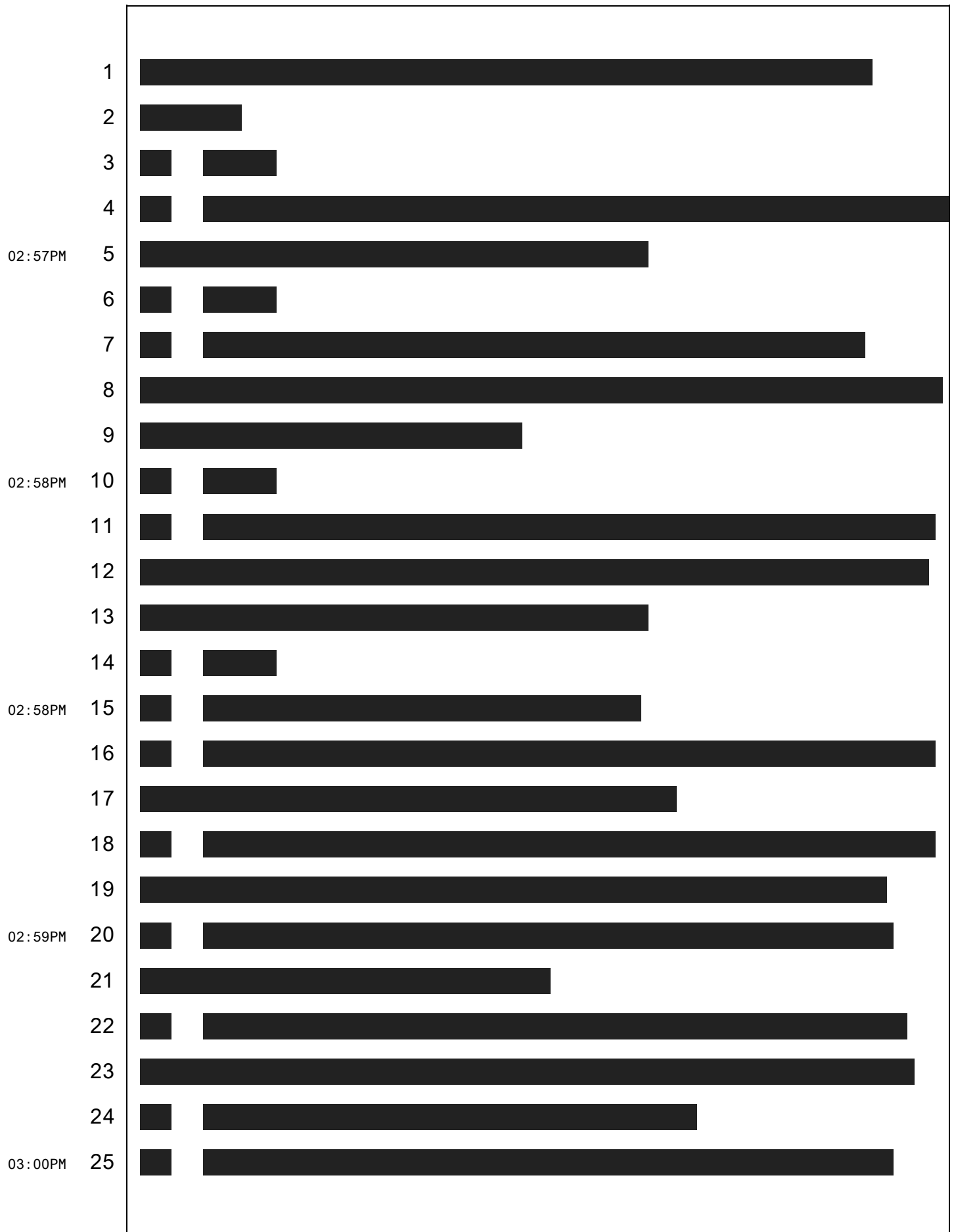
23 [REDACTED]

24 [REDACTED]

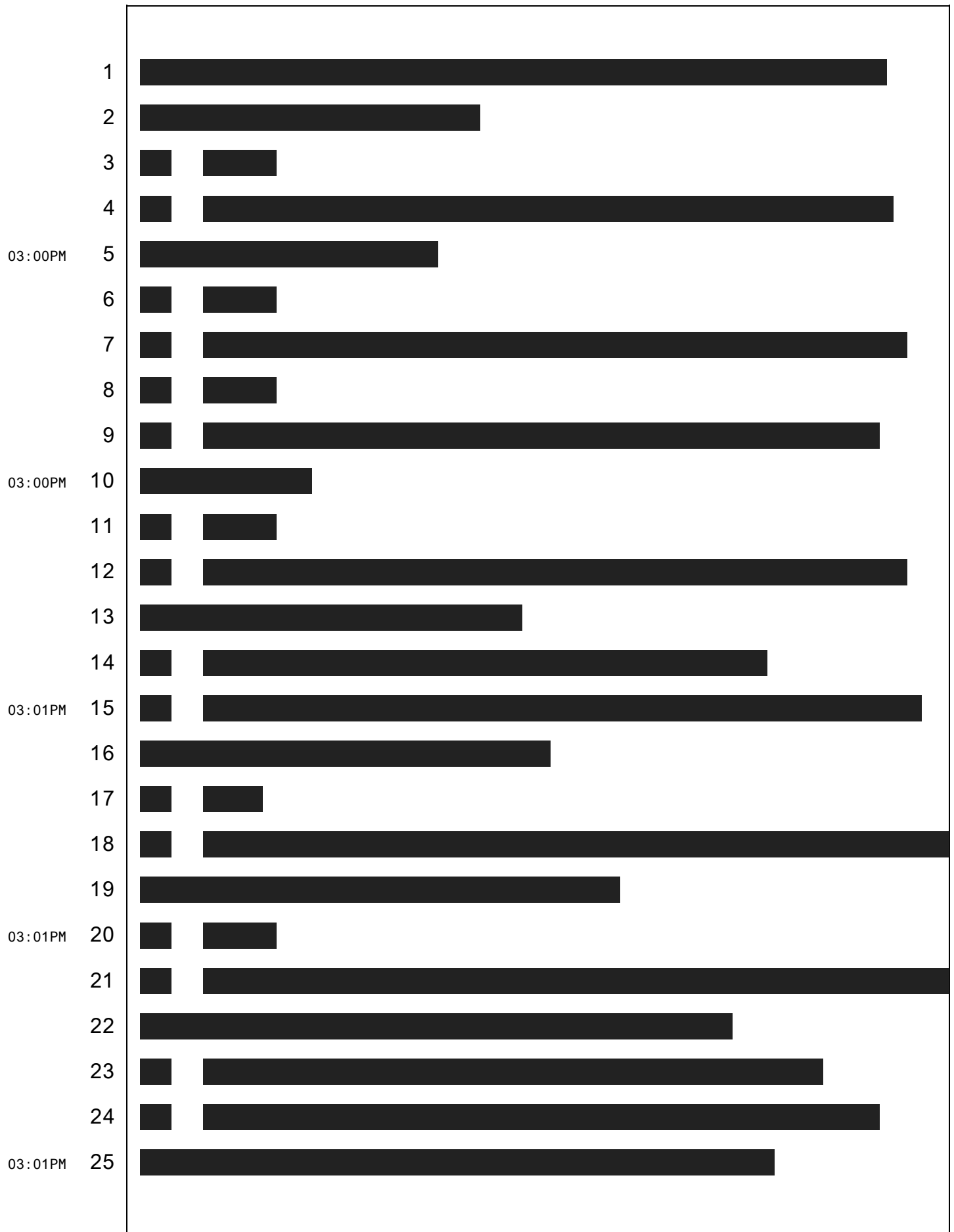
02:55PM

25 [REDACTED]









1 [REDACTED]  
2 [REDACTED]  
3 [REDACTED]  
4 [REDACTED]  
03:02PM 5 [REDACTED]  
6 [REDACTED]  
7 [REDACTED]  
8 [REDACTED]  
9 [REDACTED]  
03:02PM 10 [REDACTED]  
11 [REDACTED]  
12 [REDACTED]  
13 [REDACTED]  
14 [REDACTED]  
03:02PM 15 [REDACTED]  
16 (Proceedings now unsealed.)  
17 THE COURT: Now if you'll identify your next  
18 witness by deposition, please, counsel.  
19 MR. DIXON: Thank you, your Honor. Acorn would  
03:02PM 20 like to call, by deposition, Acorn engineer  
21 David Moreau. This deposition clip will take 13  
22 minutes, 25 seconds.  
23 THE COURT: Please proceed with this witness by  
24 deposition.  
03:03PM 25 MR. DIXON: Thank you, your Honor.

1 DAVID MOREAU,  
2 having been first duly sworn, testified via deposition  
3 testimony as follows:

03:03PM

4 Q. Can you please state your name and address for the  
5 record.

6 A. My name is David Moreau.

7 Q. What is your title at S2?

03:03PM

8 A. I'm a manager of one of the processing integration  
9 team. The name of that team is PI-TD, which stands for  
10 "process integration-technology development."

11 Q. Okay. So to your knowledge, does Samsung monitor  
12 the amount of oxide on the surface of an epitaxial  
13 source or drain region on monitor wafers related to the  
14 14-nanometer process?

03:03PM

15 A. So the answer to that question would be "no."

16 Q. Okay. Does Samsung monitor the amount of oxide on  
17 the surface of an epitaxial source/drain region on  
18 production wafers related to the 14-nanometer process?

03:04PM

19 A. So there are some ways of monitoring whether or not  
20 there are some oxide left in the epitaxial fluorine  
21 layer.

22 Q. And what are some -- and what are those ways?

23 A. One of the ways to measure the contact resistance.

03:05PM

24 Q. In what way does measuring the contact resistance  
25 let you know whether there's oxide left?

1 A. So in our process flow here at Samsung with 14 -- 14  
2 FinFET nanometer, there is no oxide at the interface  
3 between the epitaxial and the contact. If you had  
4 some -- some -- some oxide, you will expect to see a  
03:05PM 5 shift in the contact resistance measurement.

6 Q. And when you say, "shift in the contact resistance  
7 measurement," do you mean that if you had some oxide,  
8 contact resistance measurement would go up?

9 A. Yes.

03:05PM 10 Q. How do you know?

11 A. So that's part of the -- I mean, of -- the intent of  
12 the process flow, if we have, again, oxide left,  
13 silicide formation will be not done properly with the  
14 process flow that Samsung has.

03:06PM 15 Q. But you said that if there were oxide left, the  
16 contact resistance measurement would go up. What was  
17 the basis for that statement?

18 A. So if there is oxide left at the interface, we are  
19 not going to be able to form a proper silicide, then  
03:06PM 20 there will be very poor contact resistance between. We  
21 mentioned -- higher contact resistance. That's what I  
22 meant.

23 Q. Okay. So you're saying that if a proper silicide is  
24 not formed, the contact resistance will go up; is that  
03:07PM 25 right?

1 A. That's correct.

2 Q. How do you know that?

3 A. The -- this is a common -- this is knowledge from  
4 the contact team -- from the contact process that we  
03:07PM 5 have that good silicide is mandatory.

6 Q. So in what other ways does Samsung monitor where  
7 there's -- that there's some oxide left in the epitaxial  
8 layer?

9 A. I assume your -- your -- and your question is  
03:07PM 10 relating to the contact formation to the epitaxial  
11 layer, correct?

12 Q. Yes.

13 A. So we have a -- we have a process flow -- we have a  
14 process step where the process is to ensure there is no  
03:08PM 15 oxide left on top of the epitaxial regions, and we -- we  
16 monitor that particular process steps on NPW.

17 Q. And what is the process step to ensure there's no  
18 oxide left?

19 A. So before -- at some point when the -- after the  
03:08PM 20 contact have been etched, we are depositing titanium and  
21 titanium nitride layers. During that particular step,  
22 there is a processing chamber where the purpose is to  
23 remove oxide.

24 Q. Okay. And in what way do you monitor that process  
03:09PM 25 step on NPW?

1 A. So we monitor the particular silicon oxide etch rate  
2 where we monitor the amount of oxide removed.

3 Q. Okay. So does "NPW" mean nonproduction wafer?

4 A. This is correct.

03:09PM

5 Q. Okay. So on a nonproduction wafer, you test how  
6 much oxide the SiConi step removes, and then you assume  
7 that that SiConi step removed that amount on production  
8 wafers; is that right?

03:10PM

9 A. This is how the process step is -- the -- this is  
10 how the SiConi process is being -- being monitored,  
11 correct.

12 Q. Okay. Is there any way in which Samsung monitors or  
13 measures the -- whether or not there is actually oxide  
14 left in the contact layer to the epitaxial region?

03:10PM

15 A. So we -- again, we have electrical measurement of  
16 contact resistance that is one way to detect if there  
17 are oxide -- which is your claim -- left on top of the  
18 epitaxial layer.

03:11PM

19 Q. Okay. And we discussed that one. Are there any  
20 other ways in which Samsung monitors or measures whether  
21 or not there is oxide left in the contact layer to the  
22 epitaxial region?

23 A. No.

03:11PM

24 Q. Have you ever been involved in any analysis of  
25 whether there is oxide present in the contact layer to

1 the epitaxial region in a completed wafer?

2 A. Have I personally been -- personally been involved?

3 No.

4 Q. Okay. Are you aware of any analysis of whether

03:11PM

5 there is oxide present in the contact layer to the

6 epitaxial region in a completed wafer?

7 A. I know that we have a failure analysis laboratory

8 that is capable of those type of analysis.

9 Q. Are you aware of whether any of those elemental

03:12PM

10 composition analyses have shown oxide at the interface

11 layer?

12 A. No, I am not aware that any oxide is being shown.

13 Q. Did you prepare in any way to testify on that point?

14 A. Yes.

03:12PM

15 Q. Okay. So did you confirm that their elemental

16 composition analyses have not shown oxide, or do you

17 just not know?

18 A. No, I have not confirmed with them.

19 Q. Why not?

03:13PM

20 A. So our process flow is designed to not leave any

21 oxide at the interface. Should we have oxide at the

22 interface, we would see that silicide formation contact

23 resistance and additional -- and potentially -- so

24 that's why I did not confirm anything with them because

03:13PM

25 that's not the --

1 Q. Well -- I'm sorry. Go ahead.

2 A. Because that is not the purpose of our 14-nanometer  
3 contact scheme, to have any oxide layer there.

03:13PM

4 Q. Do you understand that an allegation in this  
5 litigation is that there is an oxide layer there?

6 A. Yeah, I understand this is a -- correct.

7 Q. Okay. And I'm scrolling up to Topic 8, which  
8 includes a discussion of any presence of oxygen there;  
9 right?

03:14PM

10 A. Yes, it's what is written on Item Number 8.

11 Q. Okay. And you prepared to testify on Topic 8 on  
12 behalf of Samsung; right?

13 A. Yes, I am.

03:14PM

14 Q. And you believe that the failure lab has elemental  
15 analyses of the contact layer that may show whether or  
16 not there is an oxide there; right?

17 A. Yes.

18 Q. But you chose not to look at those analyses in  
19 preparing for Topic 8; is that right?

03:15PM

20 A. There is no -- I mean, again, there is no oxide --  
21 the purpose -- and we went through this, the purpose of  
22 how the silicide is being formed into the SiConi chamber  
23 that we briefly discussed previously in your previous  
24 question. The purpose of a 14-nanometer FinFET process  
03:15PM 25 flow silicide formation is to not have any oxygen left



1 before the titanium layer is deposited.

2 Q. I understand that that's the purpose, but you chose  
3 not to check in preparing for Topic 8; is that right?

4 A. I didn't go check the FA record; this is correct.

03:16PM 5 Q. Has Samsung made or does Samsung intend to make any  
6 modifications or design-arounds to the 14-nanometer node  
7 as a result of this lawsuit?

8 A. No.

9 (End of video testimony of David Moreau.)

03:16PM 10 THE COURT: Does that conclude this witness by  
11 deposition?

12 MR. DIXON: It does, your Honor.

13 THE COURT: Call your next witness.

14 MR. DIXON: Thank you, your Honor. Acorn would  
03:16PM 15 like to call, by deposition, Samsung engineer Moon-Young  
16 Jeong. This deposition clip will take 3 minutes and 35  
17 seconds.

18 THE COURT: Please proceed.

19 MOON-YOUNG JEONG,

03:16PM 20 having been first duly sworn, testified via deposition  
21 testimony as follows:

22 Q. Can you please state your name for the record?

23 A. Moon-Young Jeong.

24 Q. What is your position at Samsung?

03:17PM 25 A. Principal engineer.

1 Q. Have you ever worked with logic devices while at  
2 Samsung?

3 A. No.

03:17PM

4 Q. Have you had any involvement with attempts to lower  
5 contact resistance?

6 A. I have not participated in the development of the  
7 process.

03:17PM

8 Q. It says here on the Exhibit 1 that you were a  
9 visiting scholar at Stanford University from 2012 to  
10 2013. Do you see that?

11 A. Yes, I see it.

12 Q. What is the role of a visiting scholar?

13 A. I think the main reason is to figure out certain  
14 trends or trajectory of research.

03:18PM

15 Q. Did you work with Professor Saraswat while at  
16 Stanford?

17 A. Yes. I went to Professor Saraswat's lab.

18 Q. What were you doing at Professor Saraswat's lab?

03:18PM

19 A. So I observed what was going on in that lab and  
20 trying to figure out if there is anything that I could  
21 be -- that I could find anything of use that I could  
22 apply to DRAM. I was trying to figure that out.

23 Q. And did you have any interactions with  
24 metal-semiconductor contacts while a visiting scholar?

03:19PM

25 A. No, I did not.

1 Q. Did you live in California while you were a visiting  
2 scholar?

3 A. Yes.

4 Q. Have you ever heard of Daniel Grupp?

03:19PM

5 A. No.

6 Q. Have you ever heard of Daniel Connelly?

7 A. I'm not sure. I don't know.

8 Q. Have you ever read any papers by Daniel Connelly?

9 A. I'm not sure.

03:19PM

10 Q. What about any patents by Daniel Connelly?

11 A. I'm not sure.

12 Q. Have you read an article called "Fermi-Level  
13 Depinning For Low-Barrier Schottky Source/Drain  
14 Transistors"?

03:19PM

15 A. I don't know if it's the same titled article or not,  
16 but I've read a similar top- -- similar article that  
17 deals with that topic.

18 Q. Do you recall when you first read this article which  
19 is similar?

03:20PM

20 A. I'm not sure when the first time was exactly.

21 Q. Would it have been when you were a visiting scholar  
22 at Stanford?

23 A. I think that could be possible.

24 (End of video testimony of Moon-Young Jeong)

03:20PM

25 THE COURT: Does that complete this witness by

1 deposition?

2 MR. DIXON: It does, your Honor.

3 THE COURT: All right. Before we proceed with  
4 the next witness by deposition, we're going to take a  
5 short recess.

03:20PM

6 Ladies and gentlemen, it's been roughly two  
7 hours since you were back from lunch. We'll try to keep  
8 this relatively short. If you would just simply leave  
9 your notebooks closed in your chairs, follow all my  
10 instructions, including not to discuss the case with  
11 each other, and we'll be back shortly to continue. Use  
12 this opportunity to stretch your legs and get a drink of  
13 water.

03:20PM

14 The jury's excused for recess.

03:21PM

15 (Whereupon, the jurors exit the courtroom.)

16 THE COURT: The Court stands in recess.

17 (Recess from 3:21 p.m. to 3:42 p.m.)

18 MR. DIXON: Your Honor, may I raise one point  
19 of procedural issue?

03:42PM

20 THE COURT: What's that, Mr. Dixon?

21 MR. DIXON: Your Honor, we have 50 minutes left  
22 of deposition testimony. That will take us to 4:30. I  
23 wanted to renew my request that after that, we rest for  
24 the day so that Dr. Piner can be our first witness and  
25 Mr. Dell could testify after him. We will still get

03:42PM

1 through both tomorrow, which means that Acorn will  
2 complete its presentation of evidence tomorrow, subject  
3 to one agreement between Acorn and Samsung, that one  
4 witness who was not available to be called on our  
03:43PM 5 direct, we could go beyond the scope of his direct when  
6 Samsung calls him in their case-in-chief.

7 THE COURT: 4:30 is awful early in the day to  
8 recess. My understanding was you were prepared to go  
9 forward with Dell today with the idea that Piner will be  
03:43PM 10 available and return from his child's graduation for  
11 tomorrow.

12 I certainly don't intend to go further than  
13 Dell, but I'm not sure I can be comfortable resting for  
14 the day before Dell testifies.

03:43PM 15 MR. DIXON: Thank you, your Honor.

16 THE COURT: All right. Let's bring in the  
17 jury.

18 (Whereupon, the jurors enter the courtroom.)

19 THE COURT: Please be seated.

03:44PM 20 Plaintiff, call your next witness.

21 MR. DIXON: Thank you, your Honor. Acorn would  
22 like to call, by deposition, Samsung engineer  
23 Kyung-Eun Byun. This deposition will take 7 minutes and  
24 42 seconds.

03:44PM 25 THE COURT: Proceed with this witness by

1 deposition.

2 MR. DIXON: Thank you, your Honor.

3 KYUNG-EUN BYUN,

4 having been first duly sworn, testified via deposition

03:44PM

5 testimony as follows:

6 Q. Ms. Byun, can you please state your name for the

7 record.

8 A. Kyung-Eun Byun.

9 Q. What was your first position at Samsung?

03:44PM

10 A. I was the expert engineer or special engineer,  
11 either of the two.

12 Q. And in which department were you working?

13 A. Initially, I worked at the graphene center.

14 Q. At any point in your career, have you worked with

03:45PM

15 Samsung's 14-nanometer FinFET process?

16 A. No.

17 Q. Before the break, we were talking about your

18 research when you first started at Samsung. Did that

19 research result in a publication of the Nano Letters?

03:45PM

20 A. Yes.

21 Q. And can we please introduce Exhibit 2, Tab 7. Have  
22 you seen this document before?

23 A. Yes.

24 Q. Is this the Nano Letters article that we've

03:45PM

25 discussed today?

1 A. Yes.

2 Q. Was there a previous research that suggested that a  
3 graphene interface layer would reduce contact  
4 resistance?

03:46PM 5 A. To my understanding before this paper, there was  
6 no -- no such thing.

7 Q. So on the right side of the first page, about nine  
8 lines down, do you see a sentence that starts with, "To  
9 solve these problems," after Footnote 11?

03:46PM 10 A. Give me a second. Yes.

11 Q. Did you write this sentence?

12 A. Yes.

13 Q. How are you aware of the fact that other groups had  
14 used thin oxide or nitride films to reduce the  
03:46PM 15 Fermi-level pinning effect?

16 A. From the textbook that I mentioned earlier.

17 Q. And that was the SZE textbook?

18 A. Yes.

19 Q. And then there are three footnotes at the end of  
03:47PM 20 this sentence. Do you see that?

21 A. You're talking about 17-19, right?

22 Q. Yes.

23 A. Yes, I see it.

24 Q. Did you make the decision to add Footnote 17, 18,  
03:47PM 25 and 19?

1 A. Yes.

2 Q. Did anyone else on the team have any input regarding  
3 those three citations?

4 A. No. I did it.

03:47PM 5 Q. How did you decide which papers to cite here?

6 A. I picked one of the results of the Google search --  
7 searches.

8 Q. Before writing this paper, did you know that other  
9 groups were researching thin oxide or nitride films to  
03:48PM 10 reduce the Schottky barrier?

11 A. Yes.

12 Q. Do you know if any of those groups researching thin  
13 oxide or nitride films have patents for their work?

14 A. No.

03:48PM 15 Q. Do you know if any group has a patent on a thin  
16 dielectric interface layer between a metal and  
17 semiconductor?

18 A. No.

19 Q. Would it surprise you if a group had such a patent?

03:48PM 20 A. Well, I was only aware or read it -- read about the  
21 MIS structure in the textbook, so I thought there could  
22 be patent or maybe there is no patent. That's the  
23 extent of my thinking.

24 Q. When did you first become aware of this -- of this  
03:49PM 25 Connelly paper, Exhibit 4?



1 A. I don't recall the exact time.

2 Q. How long prior to the publication of your 2013  
3 article was this?

03:49PM

4 A. Like I said earlier, I think that would have been  
5 between July or August of 2011 until the paper was  
6 published.

7 Q. When you are doing your research, other than when  
8 you, yourself, apply for a patent, do you ever look at  
9 patents filed by other teams?

03:50PM

10 A. No, not based on my recollection.

11 Q. What is the investigation team?

12 A. So the investigation team is an agency that searches  
13 if there are any documents that were done previously on  
14 that patent.

03:50PM

15 Q. Outside of the process of applying for your own  
16 patent, have you ever contacted the investigation team  
17 to look for patents?

18 A. No.

03:51PM

19 Q. Does Samsung measure the Schottky barrier height of  
20 its processes?

21 A. When you say "Samsung's processes," what are you  
22 referring to?

23 Q. Such as a 14-nanometer logic transistor.

03:51PM

24 A. I don't know what they do with the products that are  
25 mass produced.

1 Q. Have you worked on any mass-produced products?

2 A. No.

3 Q. Have you worked on any products which, when you  
4 worked on them, they were new, but they later became  
03:51PM 5 mass produced?

6 A. No.

7 Q. Did you share the work with anyone who was working  
8 on the FinFET logic process?

9 A. No. There is no one that I know in that area or in  
03:52PM 10 that side.

11 Q. Did you share your 2013 paper with others at that  
12 time? Let me specify. I meant in 2013.

13 A. No. I don't think so, not at that time.

14 (End of video testimony of Kyung-Eun Byun.)

03:52PM 15 THE COURT: Does that complete this deposition  
16 by witness by deposition?

17 MR. DIXON: It does, your Honor.

18 THE COURT: Call your next witness.

19 MR. DIXON: Acorn calls Samsung engineer

03:52PM 20 Joon-Il Lee by deposition. This deposition video will  
21 last 18 minutes and 41 seconds, your Honor.

22 THE COURT: Proceed with this witness by  
23 deposition.

24 MR. DIXON: Thank you.

25 ///

1 JOON-IL LEE,  
2 having been first duly sworn, testified via deposition  
3 testimony as follows:

03:52PM

4 Q. Hello, Mr. Lee. Could you please state and spell  
5 your name for the record.

6 A. My name is Joon-Il Lee. Spelling is L-e-e. That's  
7 the last name, J-o-o-n I-l.

8 Q. Who is your current employer?

9 A. Samsung Electronics.

03:53PM

10 Q. What department do you work in at  
11 Samsung Electronics?

12 A. I'm working at the department that is in charge of  
13 the patent-related work.

03:53PM

14 Q. Is there a name for that department within  
15 Samsung Electronics?

16 A. At the present time, it's called IP team DS.

17 Q. What are the responsibilities of the IP team DS?

18 A. We are doing the work for patent applications,  
19 filing patent applications, and also licensing patents.

03:54PM

20 Q. What are your job responsibilities today in the IP  
21 team DS?

22 A. I'm in charge of licensing work.

23 Q. Does Samsung have a written policy against entering  
24 into running royalties for patent license agreements?

03:54PM

25 A. No. There is no such kind of policy.

1 Q. Does Samsung have a written policy outlining its  
2 approach to exploring patent license agreements?

3 A. There is no such kind of policy.

03:55PM

4 Q. And Samsung has entered into patent license  
5 agreements involving running royalties; correct?

6 A. Probably there would be agreements that has the form  
7 of running royalty.

03:55PM

8 Q. Not just probably; right? Samsung entered into a  
9 patent license agreement with Tessera that involved a  
10 running royalty; correct?

11 A. So in case of Tessera, as I mentioned earlier, such  
12 content was included as part of the other side's request  
13 or demand, but the payment was done in lump-sum form.

14 THE INTERPRETER: Let me just verify the last.

03:56PM

15 A. So the actual payment was based out of lump-sum  
16 payment.

17 Q. What makes a running royalty more appealing to  
18 Samsung Electronics in those circumstances?

03:57PM

19 A. So it's not as simple or clear-cut when it comes to  
20 running royalty versus lump sum because it is not just a  
21 matter of simply thinking about running rate -- royalty  
22 rate, I mean, but you have to look at overall patent  
23 agreement, how that's basically agreed upon.

03:58PM

24 For example, when it comes to semiconductor,  
25 these agreements tend to include lump sum as well as

1 permanent license. Those are included as well because  
2 when it comes to running royalty, there is a possibility  
3 that down the road, some of the patents that needs to be  
4 part of these licensing agreement, that those could  
5 increase in terms of number. So that's why, in such  
6 cases, sometimes lump-sum payment is preferred.

03:58PM

7 Q. Mr. Lee, can you see Exhibit 3 on your screen?

8 A. Yes, I do.

9 Q. Exhibit 3 is a copy of a nonexclusive license

03:58PM

10 agreement and release between Samsung Electronics  
11 Company and the board of trustees of the University of  
12 Illinois; correct?

13 A. It is correct that this was an agreement with the  
14 University of Illinois.

03:59PM

15 Q. Were you personally involved in the negotiation of  
16 this agreement?

17 A. No.

18 Q. Whom did you speak to at Samsung to prepare to  
19 testify on behalf of Samsung today regarding Exhibit 3?

03:59PM

20 A. I spoke with an individual named Chung Il Lee, who  
21 was involved with this agreement.

22 Q. Did the University of Illinois insist that Samsung  
23 needed to take a license to its patents?

24 A. Yes. What I heard is that University of Illinois  
25 said that Samsung must get the license for the patents.

04:00PM

1 Q. Did Samsung dispute whether it needed to take a  
2 license to the University of Illinois's patent?

3 A. Well, I think this applies to -- in all other cases,  
4 probably, but I believe, basically, they had a dispute.

04:00PM 5 Q. Was that dispute over whether Samsung needed a  
6 license to the University of Illinois's patents?

7 A. That is correct. While there was a dispute over  
8 whether the University of Illinois's patents are worth  
9 licensing.

04:01PM 10 Q. At the time the University of Illinois approached  
11 Samsung about taking a license, did Samsung practice any  
12 of the University of Illinois's patents?

13 A. Whether that was actually practiced or not, but in  
14 order to answer the question, you have to compare the  
04:01PM 15 product against the claims of a patent. So I do not  
16 know.

17 Q. Mr. Lee, if you will turn on Page 8 of 9 of the  
18 agreement and release of Exhibit 3.

19 A. Eighth page, yes.

04:02PM 20 Q. So Page 9 of the actual agreement and release, so  
21 one more page down. Oh, 8. There we go. And do you  
22 see a reference there to five U.S. patents?

23 A. Yes.

24 Q. Was it Samsung's position that these patents were  
04:02PM 25 invalid?

1 A. To my understanding, there were a lot of disputes in  
2 the process of negotiation of the validity of the  
3 patents.

04:02PM 4 Q. How did Samsung determine the appropriate royalty  
5 for this agreement and release with the University of  
6 Illinois?

7 A. Well, since there are many factors that are  
8 considered in the negotiation, so I don't know exactly  
9 what factors contributed to the final amount that  
04:03PM 10 resulted in this agreement.

11 Q. Do you know if Samsung shared any information with  
12 the University of Illinois about sales of products  
13 potentially practicing the patents in connection with  
14 the determination of the royalty agreement?

04:03PM 15 A. I do not know.

16 Q. Mr. Lee, can you see Exhibit 4 on your screen?

17 A. Yes, I see it.

18 Q. Mr. Lee, is Exhibit 4 a settlement and patent  
19 license agreement between Katana Silicon Technologies,  
04:04PM 20 LLC, and Longhorn IP, LLC, and Samsung Electronics?

21 A. Yes, it is the patent agreement with Katana,  
22 correct.

23 Q. Can I refer to "Katana Silicon Technologies" as KST?

24 A. Yeah. Sure.

04:04PM 25 Q. This settlement agreement resolved litigation

1 between KST and Samsung, correct?

2 A. To my knowledge there was litigation that began  
3 towards the end of negotiation, but that was resolved  
4 immediately.

04:05PM

5 Q. And you don't know one way or the other whether  
6 Samsung believed that any of its products practiced the  
7 patents covered by the patents licensed under this  
8 settlement agreement, correct?

04:06PM

9 A. My point is that under a license agreement, Samsung  
10 will have it, the right to practice the patented  
11 technology; however, the license agreement is concluded  
12 between Samsung and the other party to the agreement in  
13 order to resolve a dispute over whether Samsung  
14 practiced the patent as claimed in the patent. So I'm  
15 not saying whether Samsung did or did not practice the  
16 patent.

04:06PM

17 Q. Do you know whether Samsung practiced the licensed  
18 patents under Exhibit 4 prior to the execution of the  
19 settlement agreement?

04:06PM

20 A. KST claimed that Samsung Electronics Company was  
21 using Katana's patent.

22 Q. And what did Samsung claim?

23 A. To my knowledge, in the process of negotiation,  
24 Samsung claimed the invalidity of the --

04:07PM

25 THE INTERPRETER: Invalidity and



1 noninfringement.

2 Q. And how did Samsung determine the appropriate  
3 royalty under this settlement and patent license  
4 agreement with KST?

04:08PM

5 A. I don't know how they calculated the specific amount  
6 or how they came up with that amount, but I believe they  
7 had a discussion about the validity and relevance of the  
8 patent while they were negotiating.

04:08PM

9 Q. Do you know if Samsung shared any revenue  
10 information with KST in connection with determining the  
11 appropriate royalty?

12 A. Typically such information is not shared.

13 Q. And you don't know one way or the other whether it  
14 was shared with KST; correct?

04:09PM

15 A. I did not ask with regard to that information.

16 Q. Do you know what information, if any, was shared  
17 with KST in connection with determining the appropriate  
18 royalty under this agreement?

19 A. I don't know.

04:09PM

20 Q. Why doesn't Samsung provide revenue information  
21 during the negotiation process?

22 A. Well, typically, based on my experience during the  
23 negotiation stage, that almost never happens using the  
24 revenue information provision.

04:09PM

25 Q. Why not?

1 A. Well, basically the other party can figure out the  
2 semiconductor sales figure based on the outside sources,  
3 but the -- as far as the detailed revenue information,  
4 it almost never happens during the negotiation stage  
04:10PM 5 that it is shared.

6 Q. Did Samsung have any understanding of whether a  
7 small amount of products would be covered under the  
8 University of Illinois and Samsung agreement?

9 A. What I heard from Mr. Chung Il Lee was that, even at  
04:11PM 10 that time, there were some relevant products to some  
11 degree and amount, and there was expectation that  
12 ongoing, from that point on, there would be a lot more  
13 relevant products.

14 Q. Did Samsung have any understanding of how many  
04:11PM 15 products would be covered under the Katana-Samsung  
16 agreement?

17 A. To my understanding, those were products related to  
18 the 14-nanometer.

19 (End of video testimony of Joon-Il Lee.)

04:11PM 20 THE COURT: Does that complete this witness by  
21 deposition?

22 MR. DIXON: It does, your Honor.

23 THE COURT: Call your next witness.

24 MR. DIXON: Thank you, your Honor. The last  
04:11PM 25 witness we'll call, by deposition, today is Samsung

1 engineer Min-Hyun Lee. This deposition will last 24  
2 minutes and 45 seconds, your Honor.

3 THE COURT: Proceed with this witness by  
4 deposition.

04:12PM 5 MR. DIXON: Thank you, your Honor.

6 MIN-HYUN LEE,  
7 having been first duly sworn, testified via deposition  
8 testimony as follows:

9 Q. Please state your name for the record.

04:12PM 10 A. My name is Min-Hyun Lee.

11 Q. When you started at Samsung in 2013, what was your  
12 first job title?

13 A. Researcher. So in English my job title was  
14 researcher, and in Korean it is expert engineer.

04:12PM 15 Q. At any point while at Samsung, have you worked with  
16 Samsung's 14-nanometer FinFET process?

17 A. No, I have not.

18 Q. Mr. Lee, when did you first become aware of the 2006  
19 Connelly paper?

04:12PM 20 A. My recollection is it was around the beginning of  
21 2017.

22 Q. And how did you become aware of the 2006 Connelly  
23 paper?

24 A. My recollection is it was through Google search of  
04:13PM 25 "metal-insulator-semiconductor contact."

1 Q. So who from the team was first made aware of the  
2 Connelly paper?

3 A. So what I found out through the meetings that I had,  
4 the first person was Kyung-Eun Byun.

04:14PM 5 THE INTERPRETER: Can the interpreter just make  
6 clear one title of Ms. Byun?

7 Oh, okay. So the title is better referenced as  
8 Dr. Byun.

9 Q. How did Dr. Byun first become aware of the Connelly  
04:14PM 10 paper in 2013?

11 A. When you say "how," are you asking about a  
12 methodology?

13 Q. Yes.

14 A. Did I hear "yes"?

04:14PM 15 Q. Yes.

16 A. I heard that she was Googling a search in order to  
17 write a journal article or journal paper.

18 Q. Do you recall ever seeing a patent by Daniel Grupp  
19 and Daniel Connelly?

04:15PM 20 A. I am not certain.

21 Q. Do you recall --

22 A. As to -- as to my being uncertain, to explain that,  
23 the reason I cannot be certain to give the actual names  
24 of the patent person is because when we receive an

04:16PM 25 evaluation for the novelty of our patents, the external

1 institution evaluates our patent content, and they give  
2 notice to us whether there is such novelty or not in  
3 comparison to other patents, other certain patents. But  
4 those other certain patents are only represented by the  
04:16PM 5 application number, registration number, title, and  
6 contents only. So I don't necessarily remember the  
7 names of the person who made the patents at that time.

8 Additionally, my recollection is that they  
9 send a PDF file along with organized patents of each  
04:17PM 10 patent file; but since they are organized already, I  
11 don't necessarily read those -- each patent's files.

12 Q. Do you recall ever reading a patent regarding using  
13 an interface layer to depin the Fermi level of a  
14 semiconductor-metal junction?

04:18PM 15 A. I think you're asking two separate questions in one  
16 question. I think depinning is one question, Fermi  
17 level, and there's another question for the other one.  
18 I think I read --

19 THE INTERPRETER: The interface layer.

04:18PM 20 THE INTERPRETER: Interface layer.

21 A. I think I read on the interface layer one.

22 Q. And what do you recall reading on the interface  
23 layer?

24 A. I only recall the main request items, or main items.

04:19PM 25 THE INTERPRETER: Main claims.

1 THE INTERPRETER: Main claims. Sorry. Thank  
2 you.

04:19PM

3 A. Main claims items -- main claimed items when  
4 comparing the patents, and that is the metal -- between  
5 the metal and silicon, there's a layer which is very  
6 thin. And when I say "thin," it's a  
7 couple-nanometer-thick layer. That was the main claimed  
8 item. That's what I recall.

04:20PM

9 THE INTERPRETER: And the layer is dielectric  
10 layer.

11 MS. HARRIS: Okay.

12 THE INTERPRETER: Dielectric layer.

13 THE INTERPRETER: Dielectric layer.

04:20PM

14 THE COURT REPORTER: I'm sorry. Say that last  
15 part again, please.

16 THE INTERPRETER: Dielectric layer.

17 THE INTERPRETER: Di -- dielectric.

18 Dielectric.

04:20PM

19 Q. Do you recall whether that patent described what  
20 material the interface layer was, for example, an oxide  
21 or a nitride?

22 A. I don't have a --

23 THE INTERPRETER: Oh, go ahead.

04:20PM

24 A. I'm not certain whether I saw it in the patent or  
25 through the patent itself. I may have seen it through

1 the papers or Google search. I'm not certain.

2 Q. Do you have any recollection as to the material?

3 A. Are you talking about the patent, or are you talking  
4 about the papers I saw?

04:21PM 5 Q. The patent.

6 A. No, I do not recall clearly about the patent  
7 material.

8 Q. What about in the papers?

9 A. What I can recall, off the top of my head right now  
04:21PM 10 for the materials is silicon oxide, silicon nitride,  
11 titanium oxide, and zinc. Zinc --

12 THE INTERPRETER: Oxide.

13 THE INTERPRETER: Oxide. Thank you.

14 Q. Did the paper and the patent have the same authors?

04:22PM 15 A. I think it's hard for me to answer that question  
16 because I do not recall the author of the patents.

17 Q. Do you recall the author of the paper?

18 A. As for paper authors, I do recall the authors that I  
19 used in my paper: Connelly, Philip Wong, and Saraswat.

04:23PM 20 I don't remember the first name of Saraswat.

21 Q. Do you recall what year this was when you came  
22 across that patent?

23 A. Well, I must have received the reviewing materials  
24 to verify for submission of that paper. So I think that  
04:23PM 25 would have been 2016 or 2017.

1 Q. You mentioned three authors. You mentioned  
2 Connelly, Philip, and Saraswat. Did those refer to one  
3 paper or to three separate papers?

4 A. Three separate papers.

04:23PM

5 Q. Is it Samsung's policy to respect the intellectual  
6 property rights of others?

7 A. I believe so.

8 Q. Samsung takes that seriously, I assume; correct?

04:24PM

9 A. I don't think this is a scope that I can answer  
10 because I'm just a researcher, and I'm not involved in  
11 exercising the property -- I mean, exercising the patent  
12 rights or such.

13 Q. In your job as a researcher, do you take any steps  
14 to ensure that the research you are doing does not  
04:24PM 15 infringe on other companies' patents?

16 A. So in my job as a researcher, I'm not hindered or  
17 restricted by such things, but it is only when I apply  
18 for a patent that I have to conform or verify in that  
19 matter that -- yeah, that I do that.

04:25PM

20 Q. Can you please put up Tab 3 and introduce that as  
21 Exhibit 4. Have you seen this document before?

22 A. Let me verify, if you may.

23 Q. Please.

24 A. Yes. I have verified it.

04:26PM

25 Q. What is this document?



1 A. I remember this as the article that I submitted in  
2 the -- in 2017 to the peer review called RTGR.

3 Q. If you scroll to the bottom of the page, do you see  
4 that there are four references listed?

04:26PM 5 A. Yes. I'm looking at it.

6 Q. Were you the one that added these four references to  
7 this abstract?

8 A. That is correct.

9 Q. Do you see at Number 4, there's a reference to a  
04:26PM 10 paper by Connelly?

11 A. Yes, I do see it.

12 Q. When you cited the Connelly paper in this abstract,  
13 did you believe that the Connelly paper was an important  
14 paper in this field of metal-semiconductor interfaces?

04:27PM 15 A. The answer is no, and I did not choose based upon  
16 importance of the paper, but when I researched or made a  
17 search, the result of the search among the searches were  
18 that this was the most easily chosen one.

19 Q. Did you understand when you cited the Connelly paper  
04:28PM 20 in the abstract that the Connelly paper was the first to  
21 teach a thin interface layer?

22 A. To my understanding, that is not the case. Way  
23 before this abstract, when I took graduate course,  
24 master's class -- master's degree class, I learned that  
04:29PM 25 when you lower the insulator, the contact electric

1 current improves.

2 THE INTERPRETER: When you insert the  
3 insulator.

4 THE INTERPRETER: When you insert the  
04:29PM 5 insulator. I'm sorry. Yeah.

6 A. I picked this Connelly paper in the abstract I  
7 submitted because I don't know -- I don't know in which  
8 ranking, or first, second, or third, when in the showing  
9 up in the list in the search it came up, but it was one  
04:29PM 10 of the fastest search results when I did the search. So  
11 it was easily searchable. That is why I picked it.

12 Q. Did you write the sentence that, "The interface  
13 insulator is working as a tunnel barrier and depinning  
14 materials," and then try to find a footnote that  
04:30PM 15 supported the sentence, or did you find the Connelly  
16 paper first and then write a sentence to go into the  
17 abstract, after first finding the paper?

18 A. It was the former method. I wrote the sentence for  
19 abstract first and looked for the material as evidence.  
04:30PM 20 And that's what I do when I write an abstract, in  
21 general.

22 Q. What was the basis for your understanding that an  
23 interface insulator is working as a tunnel barrier and  
24 depinning material?

04:31PM 25 A. So basis is two things. The same way I mentioned

1 earlier, number one is from my past study in my  
2 college -- no, in my graduate school that I learned  
3 about it. And other than that, second is even though I  
4 did not do the additional thesis or article search, but  
04:31PM 5 it was a result from my general search and my knowledge  
6 from those searches in the past.

7 Q. Okay. So can you please introduce Tab 4 as Exhibit  
8 6?

9 A. Yes.

04:32PM 10 Q. Did you write this paper?

11 A. Let me briefly review this and confirm.

12 Yes. This is the correct paper that I  
13 submitted at the Nano Letter publication.

14 Q. Is there a reason that the 2018 paper does not cite  
04:32PM 15 the Connelly paper?

16 A. For me, I only have the reason to use certain  
17 reference. I don't have reasons not to use citing of  
18 the reference -- or certain references.

19 MR. VINSON: Could you please bring up Exhibit  
04:33PM 20 3 again, and could you please scroll down to the last  
21 page to Footnote 17.

22 Q. Does Footnote 17 of this paper reference the 2006  
23 Connelly paper?

24 A. That is correct.

04:33PM 25 MR. VINSON: Can you scroll back to the top

1 where the list of authors is written.

2 Q. And what team does Hwang Sung Woo work on?

3 A. He is the director of SAIT site.

4 Q. Which group does Kim Kinam work with?

04:33PM 5 A. He is the vice president of the whole

6 Samsung Electronics Company itself.

7 Q. Do you know if Mr. Kim is aware of the Connelly  
8 paper?

9 A. That, I do not know.

04:34PM 10 Q. Is it custom and practice for the person who did the  
11 writing to be the first author?

12 A. Yes. That is, in general, common.

13 Q. Is it custom and practice for the last author to be  
14 an advisor or a manager?

04:34PM 15 A. No. Just because you're manager, you are not put in  
16 as a last author, no.

17 Q. I would like to introduce Tab 5 as Exhibit 8.

18 Have you seen this document before?

19 A. Let me verify the document, if I may.

04:34PM 20 Q. Yes.

21 A. Yes, I verified the document. I reviewed it. Yes,  
22 I am familiar with this paper because this was written  
23 by Seung-Geol Nam, Dr. Nam, who had written on other  
24 type of 2D material and contact while I was writing a  
04:36PM 25 paper on graphene and hBN in 2017.

1 Q. Do you see that this article at Footnote 11 cites  
2 the Connelly paper?

3 A. Yes, I see it.

04:36PM

4 Q. Do you know whose decision it was to cite the  
5 Connelly article in this paper in 2D Materials?

6 A. This paper was written by Seung-Geol Nam himself,  
7 and it was his decision to cite that reference, and  
8 nobody had objected to that decision. So I believe  
9 Mr. Nam chose to make that decision. That is my

04:36PM

10 understanding.

11 (End of video deposition testimony of Min-Hyun Lee.)

12 THE COURT: Does that complete this witness by  
13 deposition?

14 MR. DIXON: It does, your Honor.

04:37PM

15 THE COURT: All right. Are you prepared to  
16 call your next witness?

17 MR. DIXON: We are, your Honor. Acorn calls  
18 Stephen Dell.

04:37PM

19 THE COURT: All right. Mr. Dell, if you'll  
20 come forward and be sworn, please.

21 (Whereupon, the witness was duly sworn.)

22 THE COURT: If you'll come around, Mr. Dell,  
23 have a seat on the witness stand.

24 Let's distribute the witness binders, please.

04:38PM

25 If you'll approach, please. Bring one to me and hand

1 one to the court security officer.

2 All right. Mr. Dixon, you may proceed with  
3 direct examination.

4 MR. DIXON: Thank you, your Honor.

04:38PM

5 STEPHEN DELL,  
6 having been first duly sworn, testified as follows:

7 DIRECT EXAMINATION

8 BY DIXON:

04:38PM

9 Q. Sir, would you please introduce yourself to the  
10 ladies and gentlemen of the jury.

11 A. My name is Stephen Dell.

12 Q. Mr. Dell, were you asked to determine the amount of  
13 damages that Samsung owes Acorn for Samsung's use of  
14 Acorn's patented technology?

04:38PM

15 A. Yes, sir, I was.

16 Q. And were you able to determine that amount of  
17 damages?

18 A. Yes, I was.

19 Q. And what is that amount?

04:39PM

20 A. My calculation of damages in this matter owed to  
21 Acorn as a result of Samsung's infringement of the  
22 asserted patents is \$326.2 million.

23 Q. And are you prepared to explain today how you  
24 determined that \$326.2 million?

04:39PM

25 A. Yes, sir.

1 Q. Well, before we get to that, maybe you could tell us  
2 a little bit about yourself. Where do you live?

3 A. Sure. I was born and raised in Houston, Texas. I  
4 currently live just -- in suburb just north of Houston  
04:39PM 5 called The Woodlands.

6 Q. Do you have a family?

7 A. I do. Married going on 20 years this year. I have  
8 two boys, 13- and 14-year-old.

9 Q. Mr. Dell, what do you do for a living?

04:39PM 10 A. So I'm the founder and president of NOVUM Consulting  
11 Group. It's a firm, as -- that I founded. We provide  
12 financial consulting and valuation services to both  
13 publicly held companies, as well as privately held  
14 companies, such as those like Acorn.

04:40PM 15 Q. And did you prepare some slides to assist you in  
16 rendering your opinions today?

17 A. Yes, sir, I did.

18 MR. DIXON: Please publish those.

19 Q. Mr. Dell, would you briefly, please, briefly explain  
04:40PM 20 your education.

21 A. Yes. Although I was introduced as a professor, I  
22 actually am not a professor. I have an economics degree  
23 from the University of Texas at Austin with a minor in  
24 business administration.

04:40PM 25 Q. Do you have any professional certifications?

1 A. I do. I am a Certified Valuation Analyst.

2 Q. Mr. Dell, can you please explain, what is a  
3 Certified Valuation Analyst?

04:40PM

4 A. So a Certified Valuation Analyst, or CVA as short --  
5 for short, is similar to a Certified Public Accountant,  
6 or CPA, in that a CPA has a credential which allows them  
7 to prepare your taxes or attest to the accuracy of your  
8 taxes.

04:40PM

9 A CVA has a similar certification which allows  
10 me to provide certified opinions of value in both  
11 litigation matters, as well as other business disputes,  
12 or even in mergers and acquisitions transactions, things  
13 such as that.

04:41PM

14 Q. Mr. Dell, how long have you worked in the area of  
15 patent valuation and licensing?

16 A. Twenty years.

17 Q. And have you received any recognition or awards for  
18 your work in that area?

04:41PM

19 A. Yes, I have. I have been recognized by Intellectual  
20 Asset Management, which is an industry group which looks  
21 at the field in the intellectual property space, and I  
22 have been recognized as one of the top patent damages  
23 and valuation experts in the world.

04:41PM

24 Q. Have you published any papers or any articles on  
25 patent licensing?



1 A. Yes, I have. I've published articles, as well as  
2 chapters that have been published in books. I have also  
3 presented on the issue of patent damages, including to  
4 the University of Texas Patent Law Institute.

04:41PM

5 Q. Have you previously testified in courts in the  
6 United States on patent damages and valuation -- patent  
7 valuation?

8 A. Yes, sir, I have.

9 Q. About how many times?

04:42PM

10 A. Well, as I mentioned, I've been doing this work for  
11 20 years. I've testified in court probably over 11  
12 years ago for the first time and have done it on several  
13 occasions, five times to be exact.

04:42PM

14 Q. Is all the work that you do, Mr. Dell, related to  
15 litigation and testifying?

16 A. No, it is not. I actually do quite a bit of work  
17 outside of the litigation world. As I mentioned, my  
18 firm, as well as I, do business advisory work. So we  
19 assist clients or companies seeking to license

04:42PM

20 technology, both license out, as well as license in for  
21 companies that are seeking to license in other  
22 technology.

23 Q. Have you personally, Mr. Dell, been involved in the  
24 negotiation of patent licenses?

04:42PM

25 A. Yes, I have, on several occasions.

1 Q. Are you being compensated for your time in this  
2 case?

3 A. Yes, I am. I am being compensated at my standard  
4 hourly rate of \$495 per hour.

04:42PM 5 Q. And is that the same rate you charge for litigation  
6 work and non-litigation work?

7 A. Yes, it is.

8 Q. Is your payment in this case in any way dependent  
9 upon the outcome or what the jury may decide in this  
04:43PM 10 case?

11 A. No, sir, it is not.

12 MR. DIXON: Your Honor, at this time, we would  
13 tender Mr. Dell as an expert in the field of patent  
14 valuation and damages.

04:43PM 15 THE COURT: Is there objection?

16 MR. CORDELL: No objection, your Honor.

17 THE COURT: Without objection, the Court will  
18 recognize as an expert in those designated fields.  
19 Please continue.

04:43PM 20 MR. DIXON: Thanks, your Honor.

21 Q. Let's turn to what you did and how you did it. What  
22 you did do in this case, Mr. Dell?

23 A. Well, I was retained, as I mentioned, to calculate  
24 the reasonable royalty damages owed to Acorn as a result  
04:43PM 25 of Samsung's infringement of Acorn's patents.

1 Q. And how did you determine those reasonable royalty  
2 damages?

3 A. Well, the first thing we do is we start with the  
4 law, as we've seen previously at the beginning of this  
04:43PM 5 trial.

6 Q. And is that the law you're referring to up there on  
7 the screen?

8 A. It is. This is the patent damages statute which  
9 guides the determination of damages in a litigation  
04:44PM 10 matter such as this.

11 Q. And what does this statute tell you about how we  
12 determine the amount of damages in a patent infringement  
13 case such as this?

14 A. As shown on the slide, as we've heard already, the  
04:44PM 15 damages are calculated to be adequate to compensate for  
16 the infringement but in no event less than a reasonable  
17 royalty for the use made of the invention by the  
18 infringer.

19 Q. And I see that you've underlined the phrase, "For  
04:44PM 20 the use made of the invention by the infringer." Why  
21 did you do that?

22 A. Because that's a very important aspect of the  
23 damages statute, is understanding the value and use of  
24 the invention in ensuring that you're calculating that  
04:44PM 25 value attributed to that use.

1 Q. Now, in determining the appropriate royalty in this  
2 case, what type of information and data did you  
3 consider?

4 A. We reviewed quite a bit of information. I prepared  
04:44PM 5 a slide that summarizes, at a high level, the  
6 information we reviewed. We started obviously with  
7 looking at the patents, although I'm not a technical  
8 expert, but I did review the patents and discuss those  
9 with Dr. Piner, who is the technical expert retained in  
04:45PM 10 this case.

11 I also had discussions with Mr. Horgan, who you  
12 heard from earlier today. I've also reviewed a  
13 significant amount of confidential documents and  
14 information that were produced by both sides, Acorn, as  
04:45PM 15 well as by Samsung; and included in that, I did my own  
16 independent research, looking at license agreements and  
17 other types of documents, as well as some of the  
18 deposition testimony that we've seen played. I've  
19 reviewed that as well, including the expert reports of  
04:45PM 20 the other experts retained in all the other legal  
21 filings. So quite a bit of information.

22 Q. Can you give us an idea of approximately how many  
23 documents you might have reviewed in connection with  
24 your analysis?

04:45PM 25 A. I don't know that I have an exact count of the

1 number of documents, but it's well over 10,000 pages of  
2 documents, boxes of documents, if they were all printed.  
3 Nowadays we have the benefit of looking at them  
4 electronically.

04:46PM 5 Q. About how many hours, approximately, did you spend  
6 on your analysis?

7 A. Between myself and my team, we've spent over 500  
8 hours reviewing and analyzing all the information and  
9 preparing my opinion.

04:46PM 10 Q. So, Mr. Dell, when we put the patent statute slide  
11 up a moment ago, it referred to a reasonable royalty.  
12 What is a royalty?

13 A. I think we saw this earlier. I think Mr. Hueston  
14 actually stole my thunder in this slide, but this is --  
04:46PM 15 a royalty is very similar to a rent analogy.

16 As we heard, patents are property. Just as  
17 real property, you would pay rent for rights to use  
18 property. So as I tell my friends, if you sign the  
19 lease agreement to an apartment building, you would pay  
04:46PM 20 rent for rights to use that apartment for the term in  
21 which you agree upon.

22 Similarly with patent licenses, parties agree  
23 to pay for rights to use that patented property, and in  
24 return, they agree to pay royalties, or rent, for rights  
04:47PM 25 to use the technology.

1 Q. Are there different forms of royalties or can you  
2 structure royalties in different ways?

3 A. Yes, you can. I think we've heard a little bit  
4 about this already, as well.

04:47PM 5 Q. And what are those ways in which you can structure a  
6 royalty, or what are the different forms?

7 A. The two general forms are in lump sum, or one-time  
8 royalty payment, which is a larger payment made for the  
9 use of the technology over the entire period; as well  
04:47PM 10 as, the other form is a running royalty, which is  
11 similar to the rent analogy. You would pay for the  
12 right to use the property over -- periodic payments over  
13 time.

14 Q. And why might someone prefer a running royalty over  
04:47PM 15 a lump sum royalty?

16 A. Well, based on my experience, running royalties are  
17 often less risky. They directly calculate the use. I  
18 think you may recall, Mr. Horgan testified that if you  
19 use the technology, you pay for it; if you don't, you  
04:48PM 20 don't pay for it. And so it's a less risky proposition  
21 of paying a running royalty.

22 Q. Okay. So let's take a step back for a moment,  
23 Mr. Dell. What is the formula for calculating a  
24 reasonable royalty?

04:48PM 25 A. Well, the formula itself is rather simplistic. It's

1 the royalty base, or extent of use, multiplied by a  
2 royalty rate, or the value of that use, and the  
3 multiplication of the two of those together equals the  
4 royalty damages.

04:48PM

5 Q. How do we determine the inputs for this royalty  
6 formula?

7 A. Well, again, we turn to the law. So there's  
8 guidance that damages experts, such as myself, will use,  
9 and I've summarized these factors here on the slide.

04:48PM

10 And they are known as the Georgia-Pacific factors.

11 Q. Now, did you come up with these factors, Mr. Dell?  
12 Is this something of your own creation?

13 A. Well, the slide is my creation, but the content of  
14 the slide is not my creation, no. These are 15 factors  
15 that come from a case called the Georgia-Pacific case.

04:48PM

16 Q. And I see that these factors are grouped into three  
17 categories. Why did you do that?

18 A. Well, the -- in analyzing the individual factors,  
19 many times the factors are similar in nature. So, for  
20 example, Factor 9 and Factor 10 are related to some of  
21 the technology or the benefits of the technology, so I  
22 grouped those or categorized those together.

04:49PM

23 Similarly, there are factors related to the  
24 licensing of technology, and those would fall under the  
25 licensing factors. And then there are also other

04:49PM

1 factors that relate to the economics or the  
2 profitability, sales, things of that nature, which get  
3 categorized as the economic factors.

04:49PM

4 Q. Does every Georgia-Pacific factor apply in every  
5 case?

04:49PM

6 A. No, not in every case. In some cases, some  
7 information or evidence exists, and in other cases it  
8 doesn't. And even in one case, some factors may be  
9 relevant to other factors; so they are not always  
10 mutually exclusive, either.

04:50PM

11 Q. Now, looking at the way that you categorized these  
12 factors here on this slide, it looks like Factor 15 is  
13 not within any of your three categories. Why is that?

14 A. Well, Factor 15 is what's called the hypothetical  
15 negotiation, and that factor is oftentimes looked at as  
16 a culmination of all the other 14 factors.

04:50PM

17 Q. So tell us a little bit about this hypothetical  
18 negotiation, Mr. Dell. How should we think of this?

19 A. Well, I prepared a slide. There's -- the  
20 hypothetical negotiation is an imaginary negotiation  
21 that takes place between a patent owner and a patent  
22 user, or an infringer in a litigation context, at the  
23 date of first infringement.

04:50PM

24 Q. And what is the purpose of this hypothetical  
25 negotiation?



1 A. Well, the purpose is that -- unfortunately we're  
2 sitting here today; we know this negotiation didn't  
3 occur -- but it's to look at all of the information that  
4 would be relevant as if the parties did come together at  
04:50PM 5 the date of first infringement and would have agreed  
6 upon a license agreement for rights to use the patents  
7 at issue.

8 Q. Are there any assumptions, Mr. Dell, that you're  
9 required to make or any ground rules as you analyze this  
04:51PM 10 hypothetical negotiation?

11 A. Yes, there are.

12 Q. And are those the ground rules that which we see  
13 here on this slide?

14 A. Yes, that's correct. As you can see, the -- as this  
04:51PM 15 recreated negotiation or imaginary negotiation, the  
16 parties would recognize that Acorn -- it must assume in  
17 part that Acorn's patents are valid and infringed and  
18 enforceable.

19 Samsung would also acknowledge that they  
04:51PM 20 infringed those patents, and they must pay for rights to  
21 use those patents. So they must enter into a license  
22 agreement.

23 And as part of that construct, the parties  
24 would willingly negotiate; and as part of that  
04:51PM 25 negotiation, they would willingly share information, all

1 the information that we've heard or will hear throughout  
2 the trial. They would have willingly shared that in  
3 this imaginary negotiation so that they could ultimately  
4 come to an agreement.

04:51PM 5 Q. Now, the second checkmark says, "Samsung's products  
6 infringe," correct?

7 A. Yes, that's correct.

8 Q. Now, isn't Samsung contending that it doesn't  
9 infringe Acorn's patents?

04:52PM 10 A. Yes, sir, that's correct.

11 Q. So what's the significance of that second checkmark?

12 A. Well, that's -- again, we have to assume, in order  
13 to calculate damages, that the patents themselves -- or,  
14 excuse me, that Samsung does infringe the patents.

04:52PM 15 Q. And are these ground rules, are these assumptions  
16 something that all damages experts must make in  
17 considering a hypothetical negotiation?

18 A. Yes, sir, they are.

04:52PM 19 Q. When should we assume that this hypothetical  
20 negotiation occurred?

21 A. Well, it takes place at the date of first  
22 infringement.

23 Q. And when was that, sir?

04:52PM 24 A. In this case, the date of first infringement is  
25 January of 2015, when Samsung first manufactured the

1 accused wafers or accused products incorporating the  
2 accused technology at its fabrication facility in  
3 Austin.

04:53PM

4 Q. And who would have been the parties at this  
5 hypothetical negotiation?

6 A. At the time in January of 2015, Acorn Technologies  
7 was the owner of the patents at the time, and Samsung  
8 was the user of the technology, or the infringer of the  
9 technology, at that time also.

04:53PM

10 Q. Now, the Plaintiff in this matter is  
11 Acorn Semi, LLC, correct?

12 A. Yes, sir, that's correct.

04:53PM

13 Q. And does the fact that Acorn Semi is the Plaintiff  
14 and, yet, Acorn Technologies would have been at the  
15 hypothetical negotiation table make any difference in  
16 your analysis?

04:53PM

17 A. No, none whatsoever. As we heard Mr. Horgan testify  
18 a little while ago, Acorn Semi is a wholly-owned  
19 subsidiary of Acorn Technologies. It's the same  
20 decisionmakers for both companies; and, therefore, it  
21 would not have any meaningful impact on the outcome of  
22 the negotiation.

04:53PM

23 Q. Mr. Dell, there are four patents in this case, each  
24 with different issue dates. Does that mean we would  
25 have four different hypothetical negotiations?

1 A. No, it would not be four separate hypotheticals,  
2 because at the time of the January 2015 negotiation,  
3 some of the patents that are at issue in this case were  
4 pending at the time. And as often common practice in  
04:54PM 5 the licensing world, the parties would recognize that  
6 they would seek to license the patent that was issued,  
7 as well as other patents that would be related to that  
8 patent later on.

9 Q. And did you, Mr. Dell, use the hypothetical  
04:54PM 10 negotiation framework in determining the appropriate  
11 amount of damages in this case?

12 A. Yes, sir, I did.

13 Q. Let's turn to that now. I believe you told the jury  
14 that Samsung would owe Acorn \$326.2 million in damages.  
04:54PM 15 Why so much, Mr. Dell?

16 A. Well, as we go back to the damages statute that I  
17 mentioned a moment ago, when you look at the extent of  
18 use of Acorn's technology, Samsung has sold a  
19 significant amount of product incorporating Acorn's  
04:54PM 20 technology; so it's a function of the extent of  
21 Samsung's use of Acorn's inventions.

22 Q. And how did you calculate that \$326 million?

23 A. Well, we looked at a lot of confidential information  
24 that was produced as part of that analysis, but we go  
04:55PM 25 back to, again, the royalty formula that we talked about

1 earlier.

2 Q. And is that the formula that we see here on this  
3 screen?

4 A. Yes, sir, it is.

04:55PM 5 Q. And what are the inputs to this formula, again?

6 A. It's the royalty base times the royalty rate equals  
7 the damages.

8 Q. So let's start with the royalty base, Mr. Dell. How  
9 do damages experts, such as yourself, determine the  
04:55PM 10 royalty base?

11 A. Well, once again, we turn back to what the law -  
12 what the law requires. In the first step of the process  
13 of looking at a royalty base is what's called the  
14 smallest saleable patent practicing unit.

04:55PM 15 Q. Okay. Is that what we see here on this screen?

16 A. Yes, it is.

17 Q. It's a mouthful, Mr. Dell. Can you explain what  
18 that is?

19 A. Well, it's a legal construct; but generally  
04:56PM 20 speaking, the smallest saleable patent practicing unit,  
21 or SSPPU, is the smallest unit or component that is  
22 itself sold or saleable that also practices the claims  
23 of the patent or patents.

24 Q. And how did you determine what the SSPPU is in this  
04:56PM 25 case?

1 A. Well, it's a bit of a technical exercise, and given  
2 that, again, I'm not the technical expert, I discussed  
3 this with Dr. Piner since that's his area of expertise,  
4 to gain an understanding of the accused products and how  
04:56PM 5 Acorn's patents are within those accused products.

6 Q. And what did Dr. Piner tell you, or what did he  
7 identify as the smallest saleable patent practicing  
8 unit?

9 A. Well, based on his analysis and on my discussions  
04:56PM 10 with him, although Acorn's patents benefit the chips  
11 that go into the devices that improve performance, as  
12 we've heard, the smallest saleable patent practicing  
13 unit itself is the semiconductor -- finished  
14 semiconductor wafer.

04:57PM 15 Q. And do we see an image of that semiconductor wafer  
16 on the slide on the screen?

17 A. Yes, sir, at the left, left portion of that slide.

18 Q. Okay. And we also see some other items on the  
19 slide. What are those, Mr. Dell?

04:57PM 20 A. So my understanding, the wafers are, when completed,  
21 are cut up into die and then packaged into chips, which  
22 we see in the middle, and then those are then  
23 incorporated into Samsung's devices such as phones,  
24 televisions, other end-consumer devices.

04:57PM 25 Q. And does the wafer itself, do you understand that

1 the wafer itself infringes Acorn's patents?

2 A. Yes, that's my understanding from Dr. Piner.

3 Q. And then how do those wafers -- if you could explain  
4 again, how do those Samsung wafers end up in the accused  
04:57PM 5 products in this case?

6 A. So as we heard earlier, 90 percent or more, in some  
7 years, of the Samsung -- or of the wafers are  
8 manufactured at Samsung Austin Semiconductor in Austin,  
9 here in the United States. Those wafers are then

04:58PM 10 shipped over to Samsung Electronics in -- excuse me,  
11 Samsung Electronics Company in Korea, where they are  
12 then turned into chips and then later incorporated into  
13 phones or devices that are then later imported back into  
14 the United States.

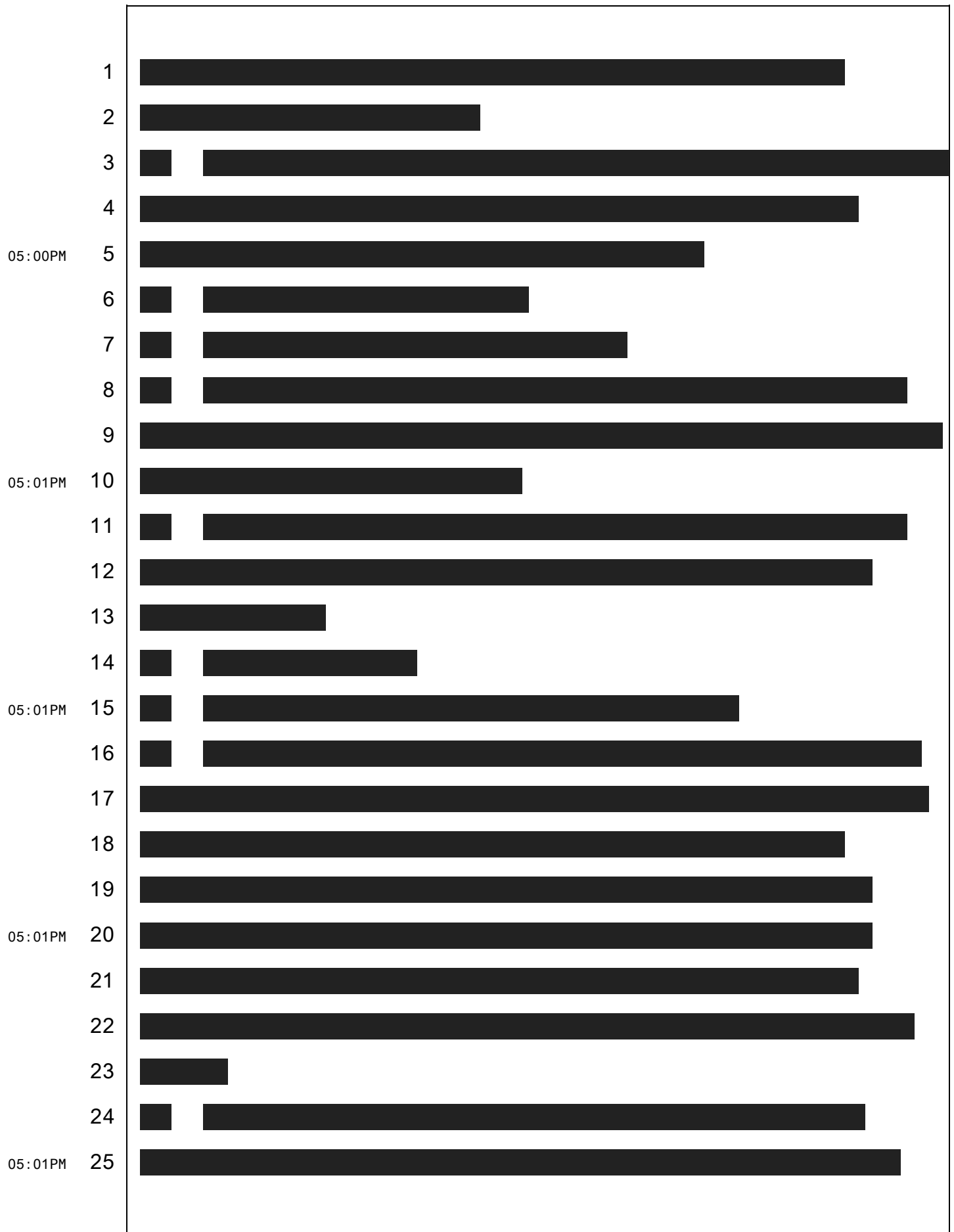
04:58PM 15 MR. DIXON: Your Honor, at this time we are  
16 going to go into some confidential information, and I  
17 would ask that we please seal the courtroom.

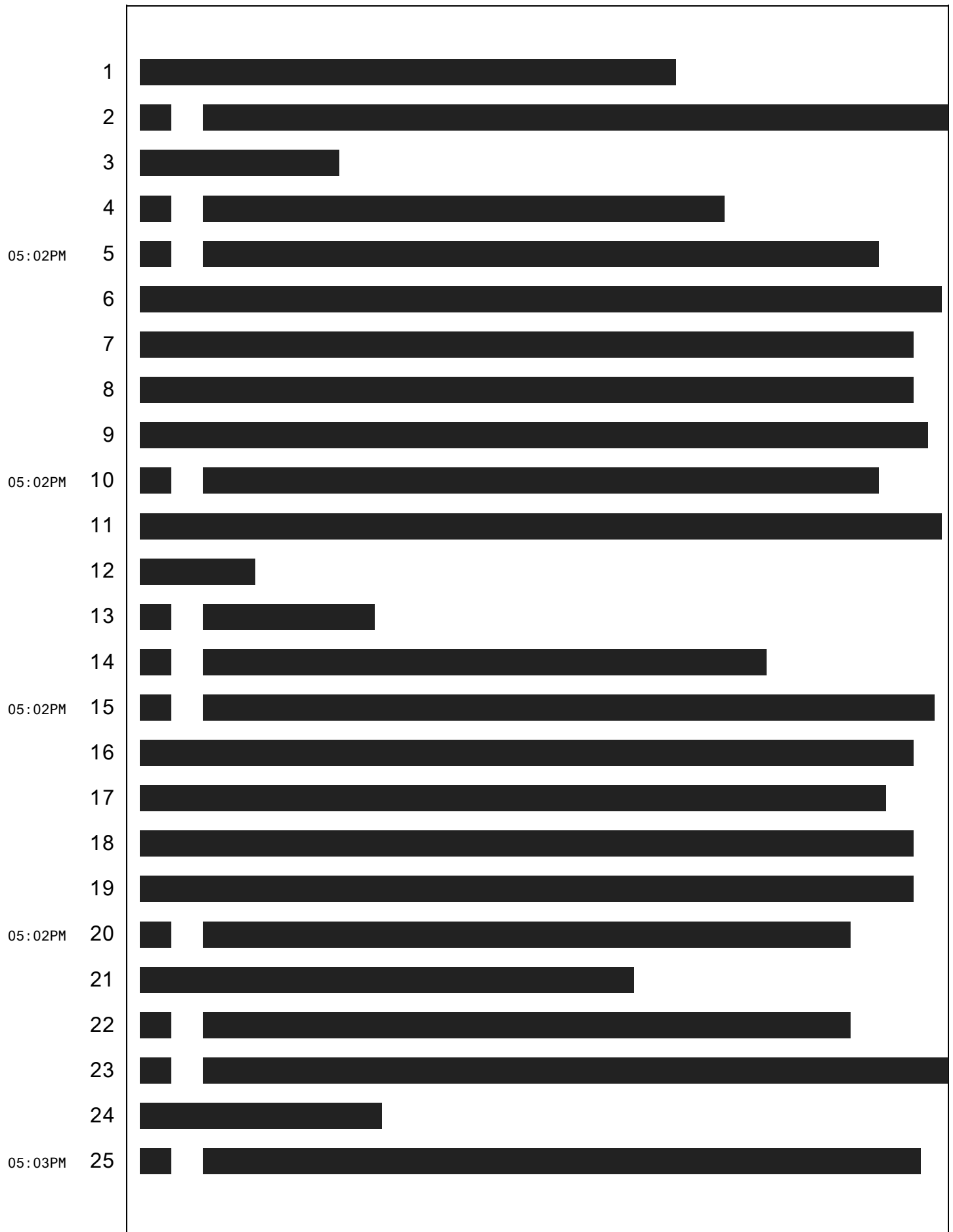
18 THE COURT: All right. Based on Counsel's  
19 request and representations, I'll order the courtroom  
04:58PM 20 sealed at this time. Those present, not subject to  
21 protective order that's been entered in this case,  
22 should exit the courtroom and remain outside until it is  
23 unsealed and reopened.

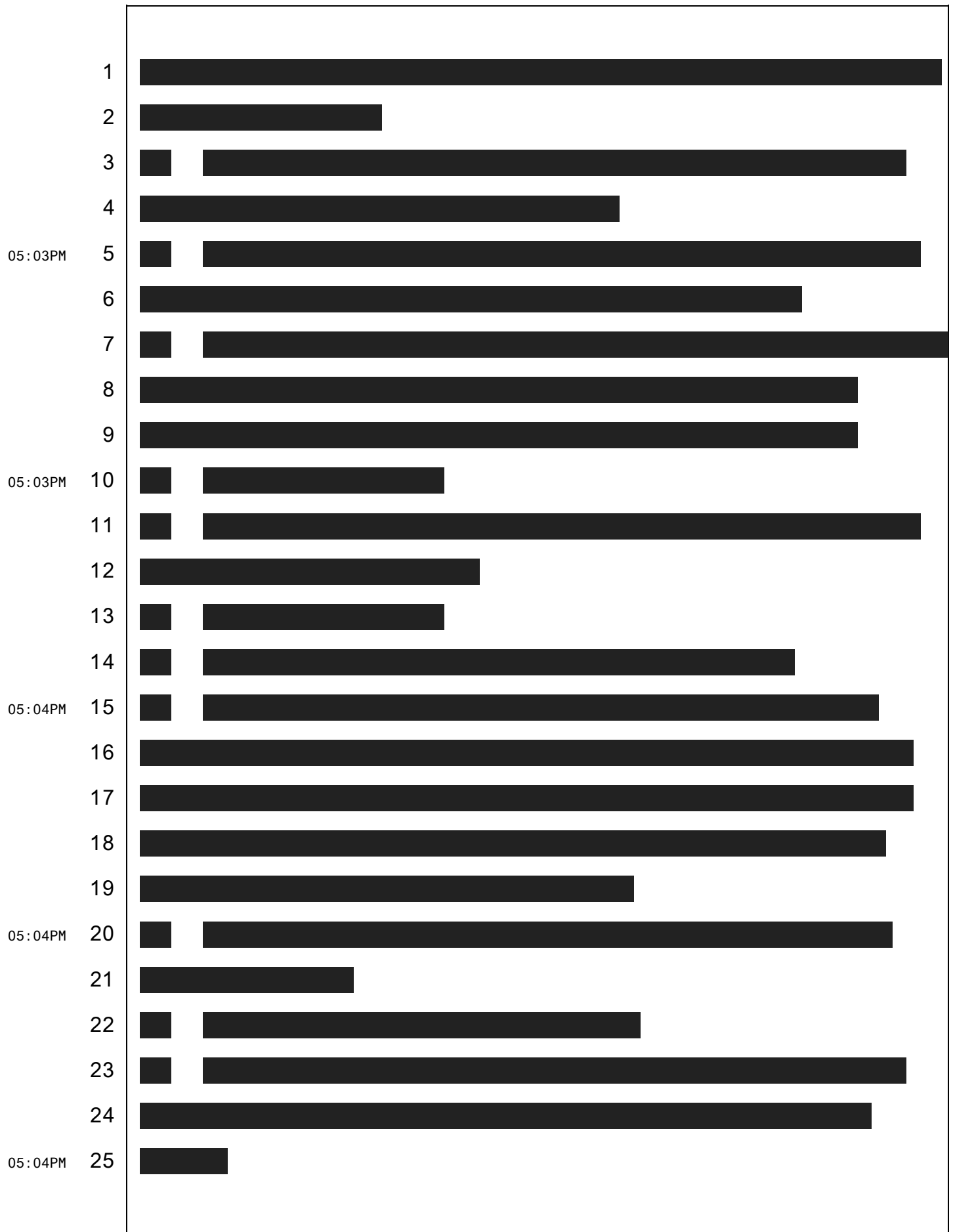
24 (Whereupon, the following portion of the  
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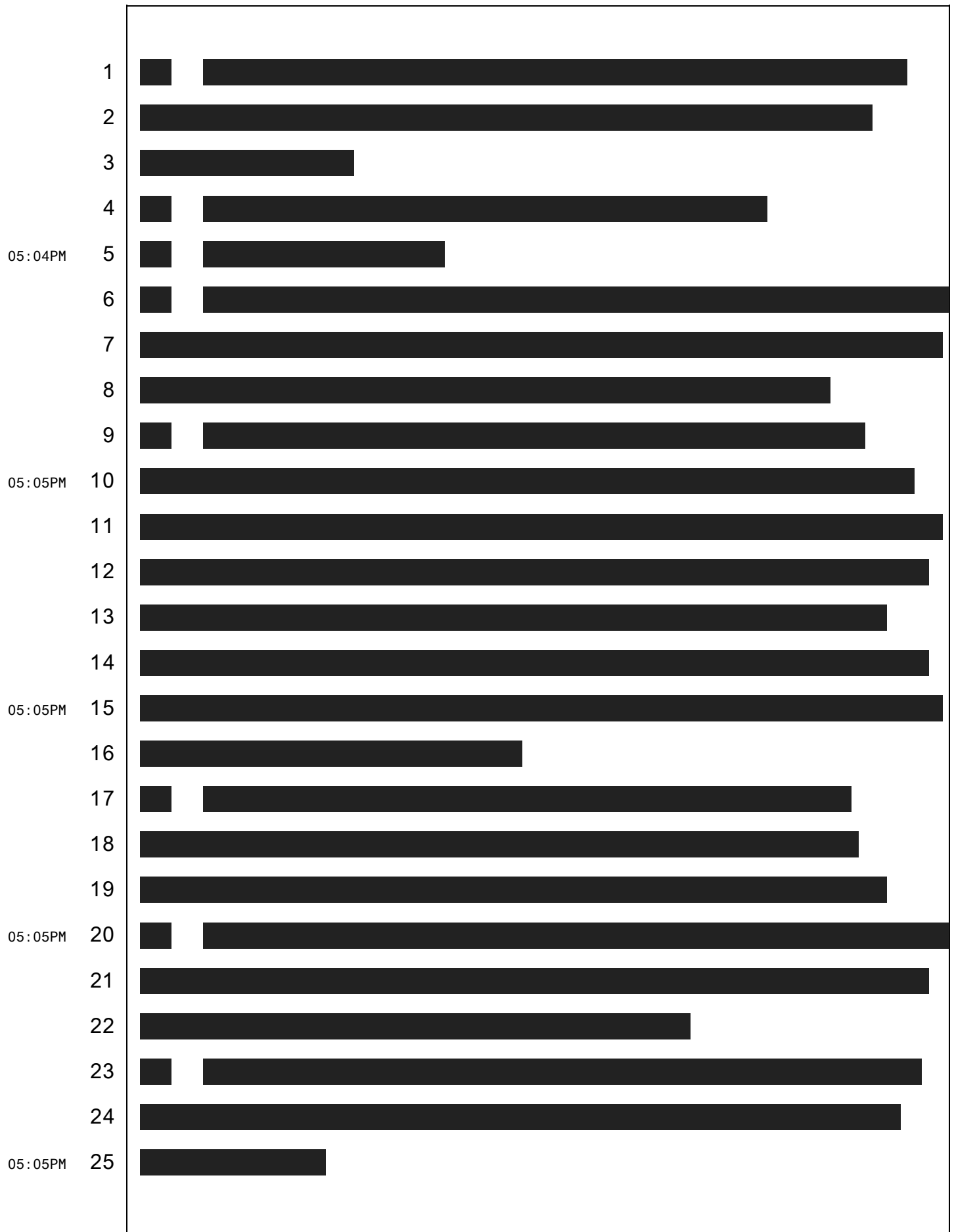
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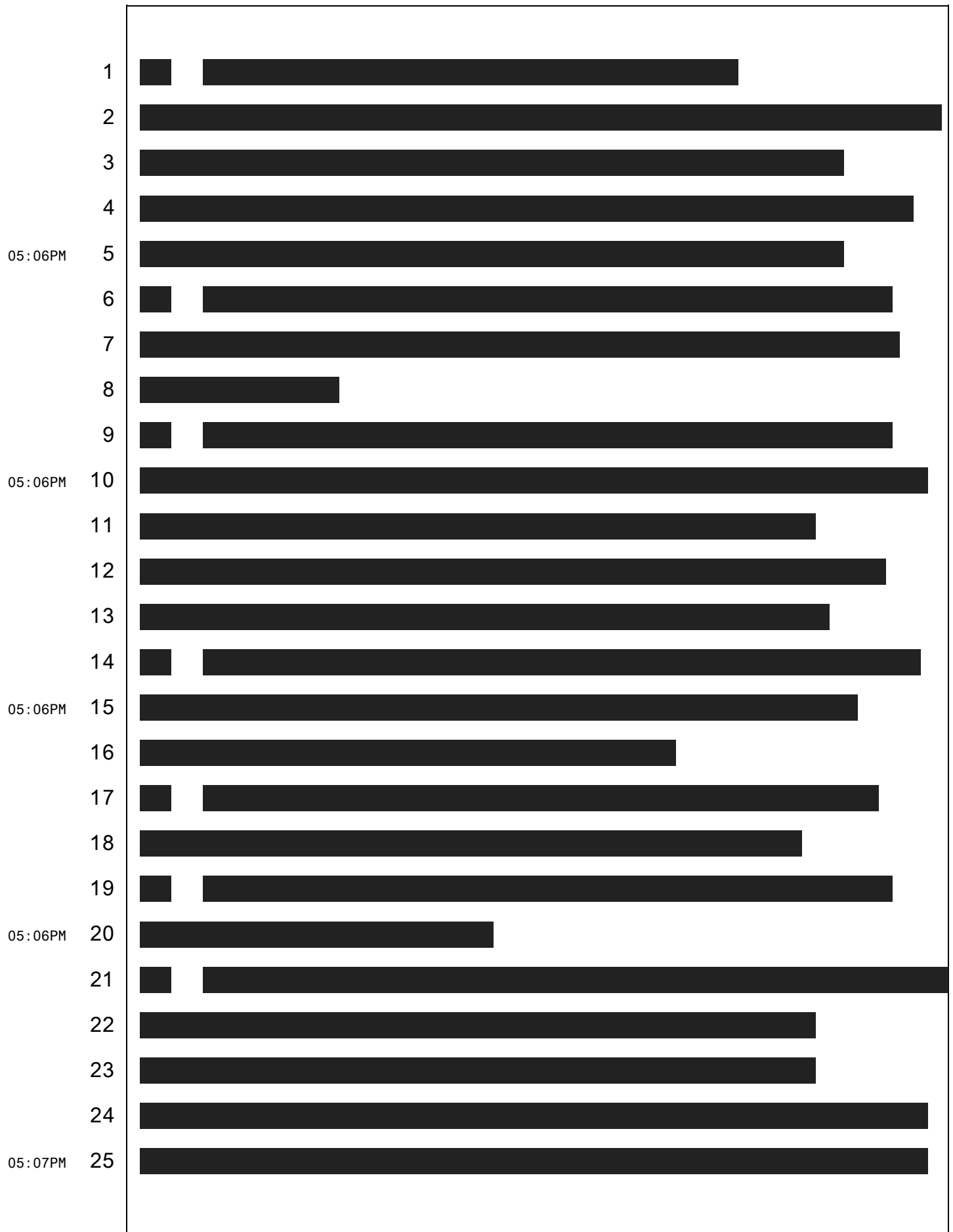


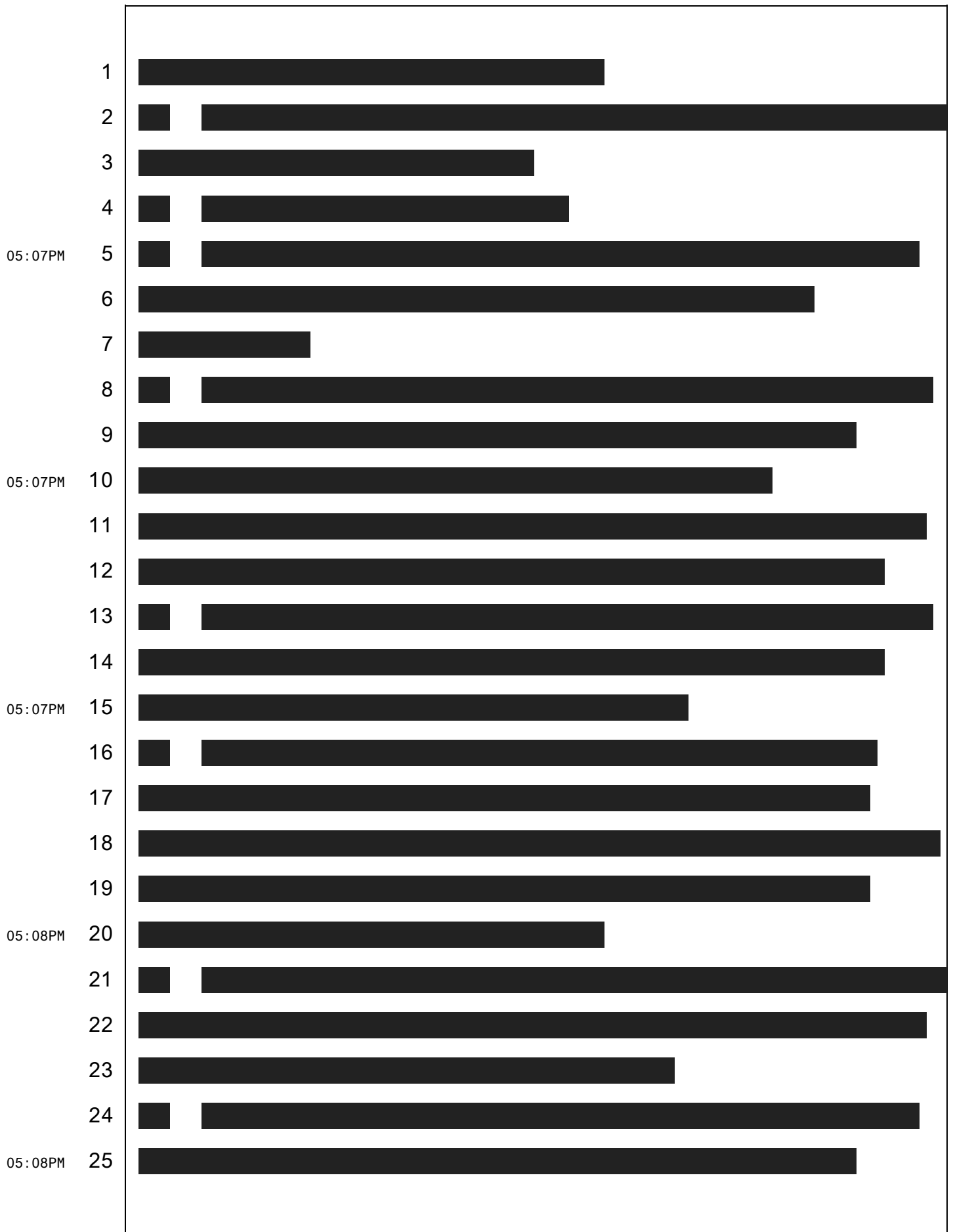


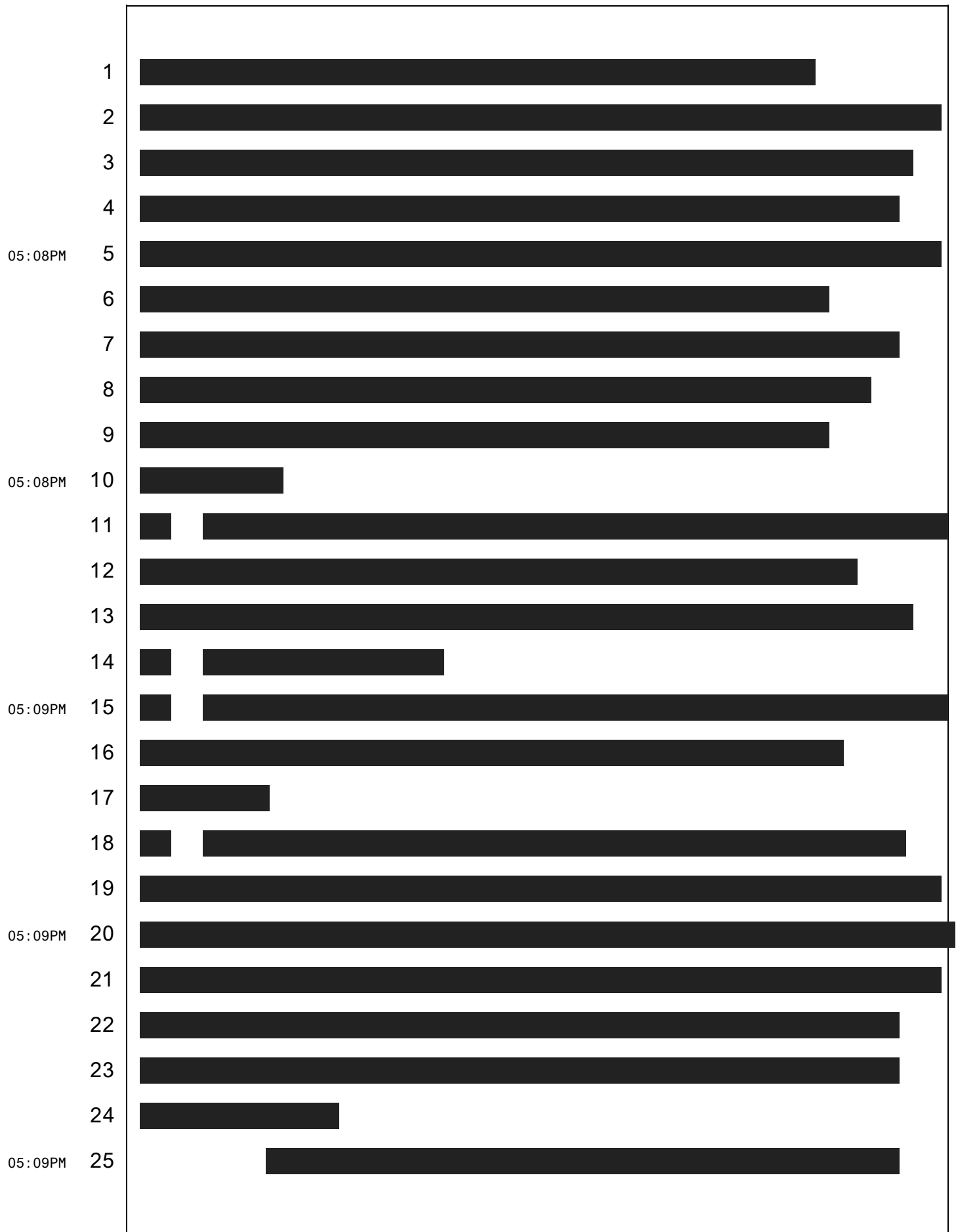


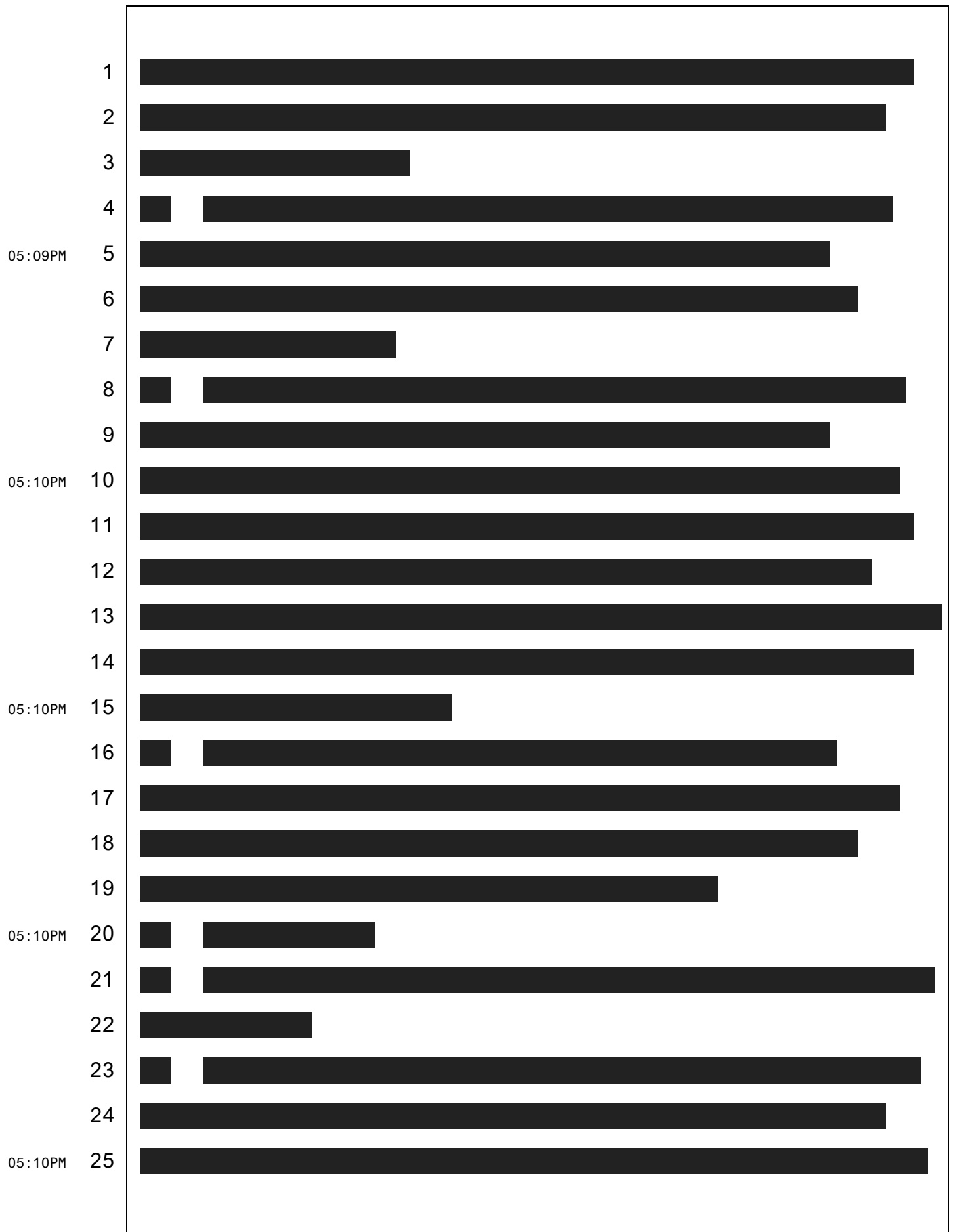




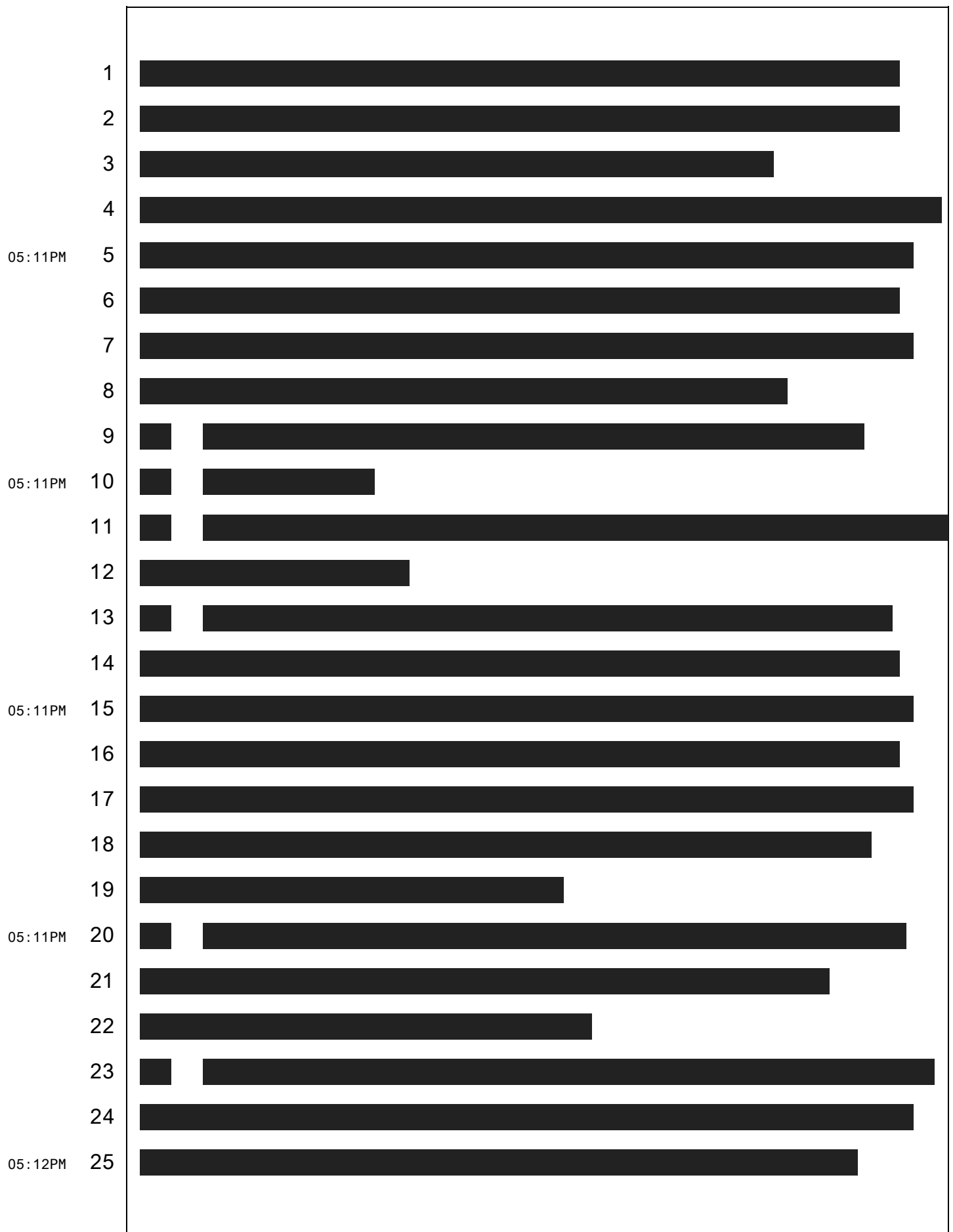


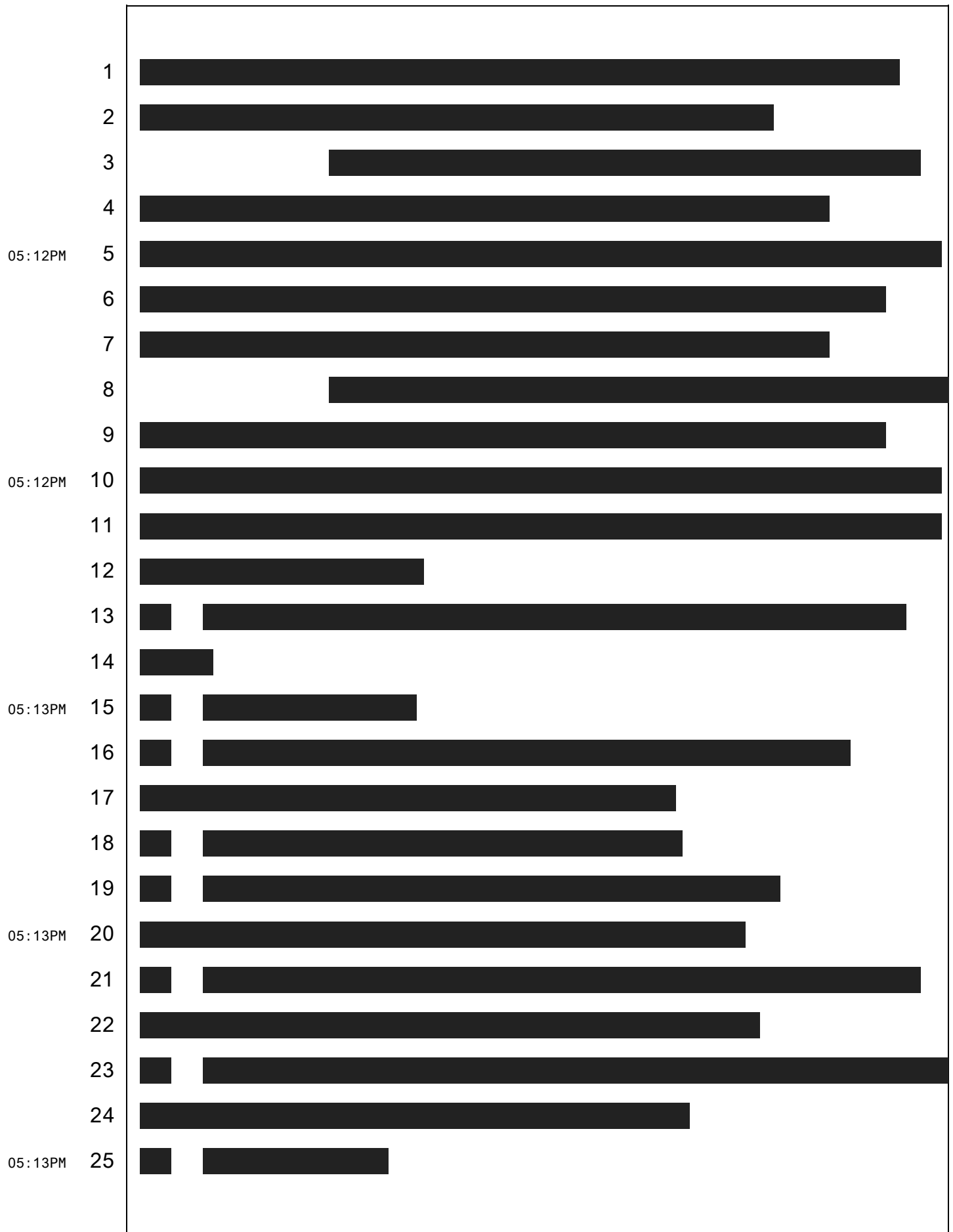


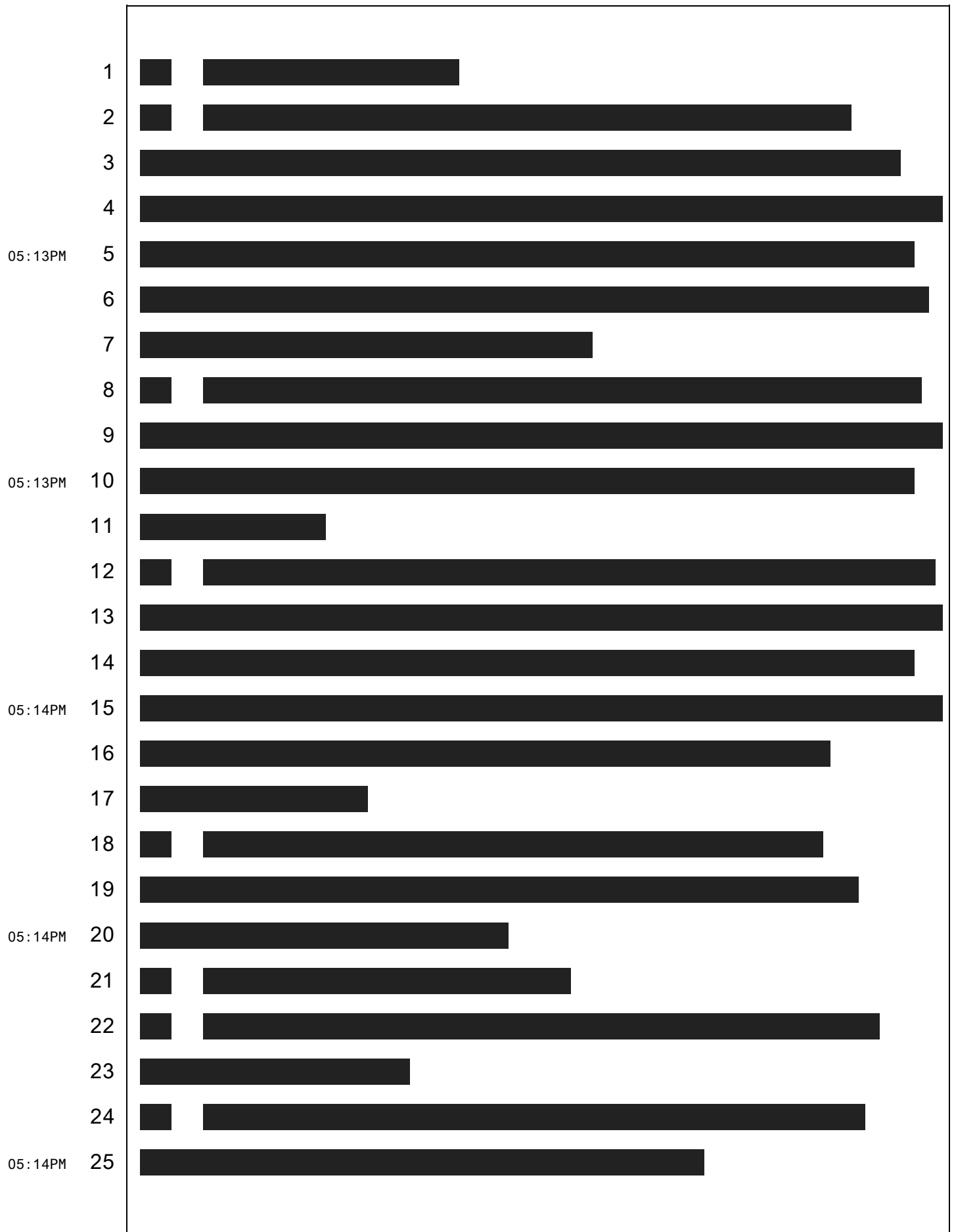


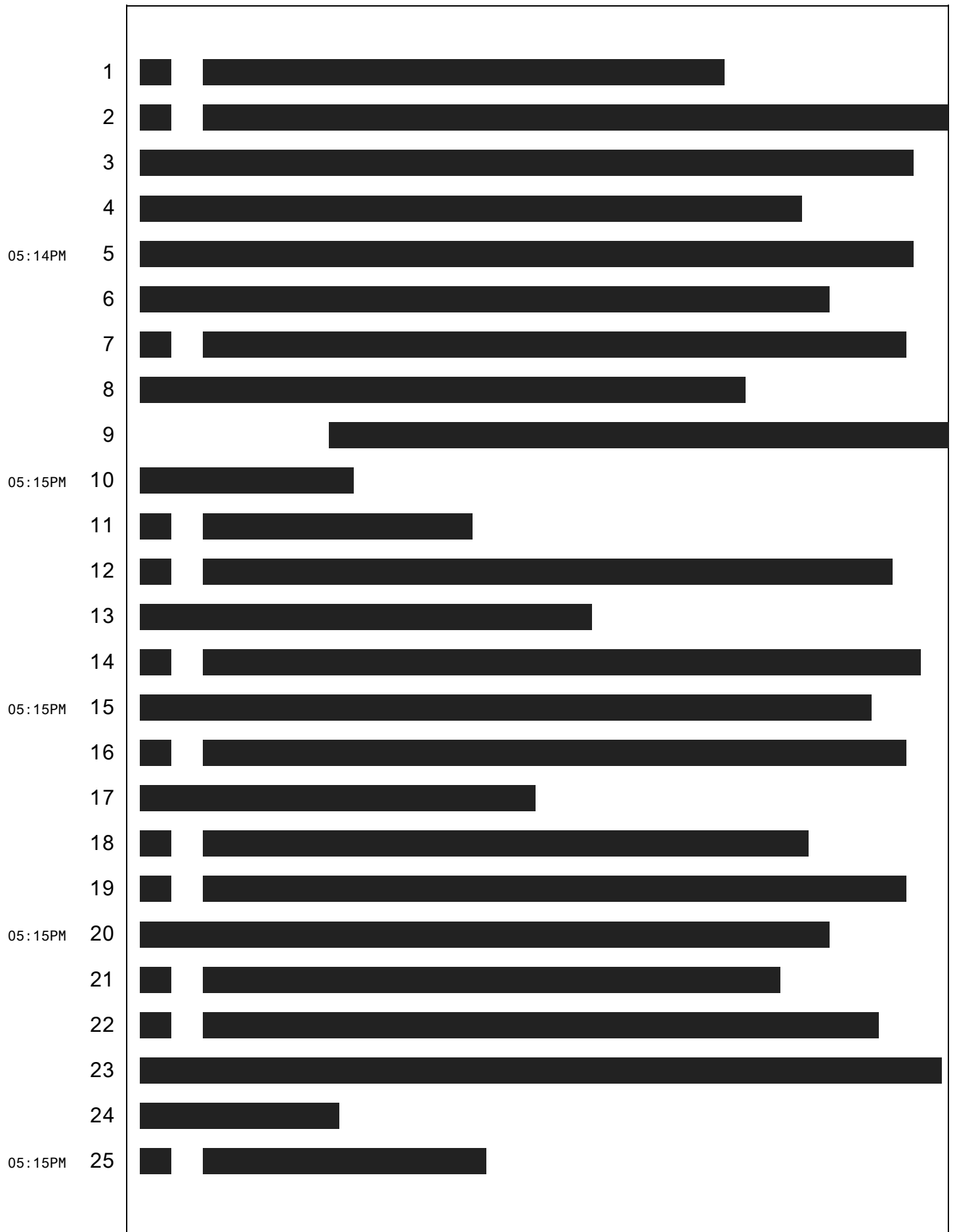


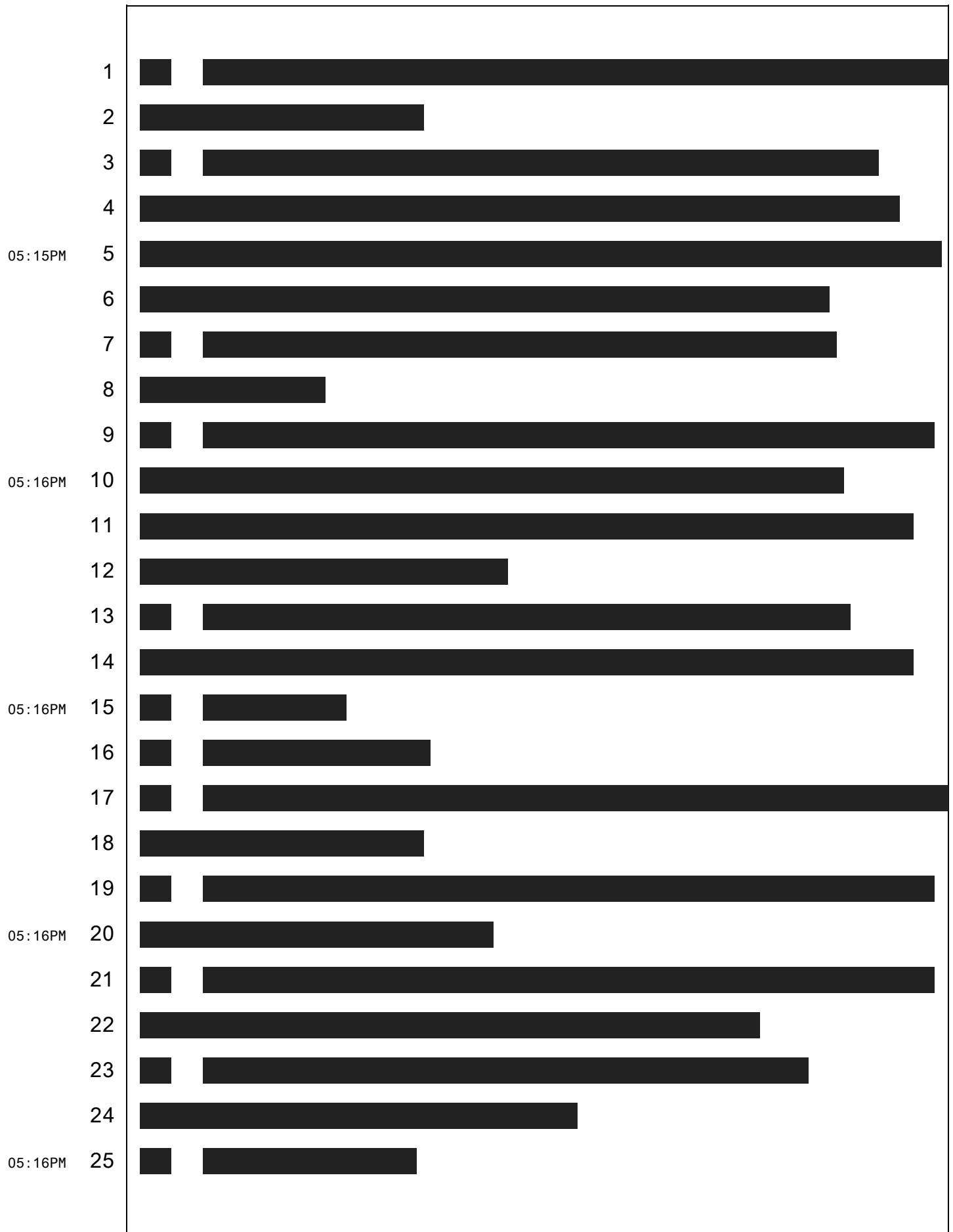


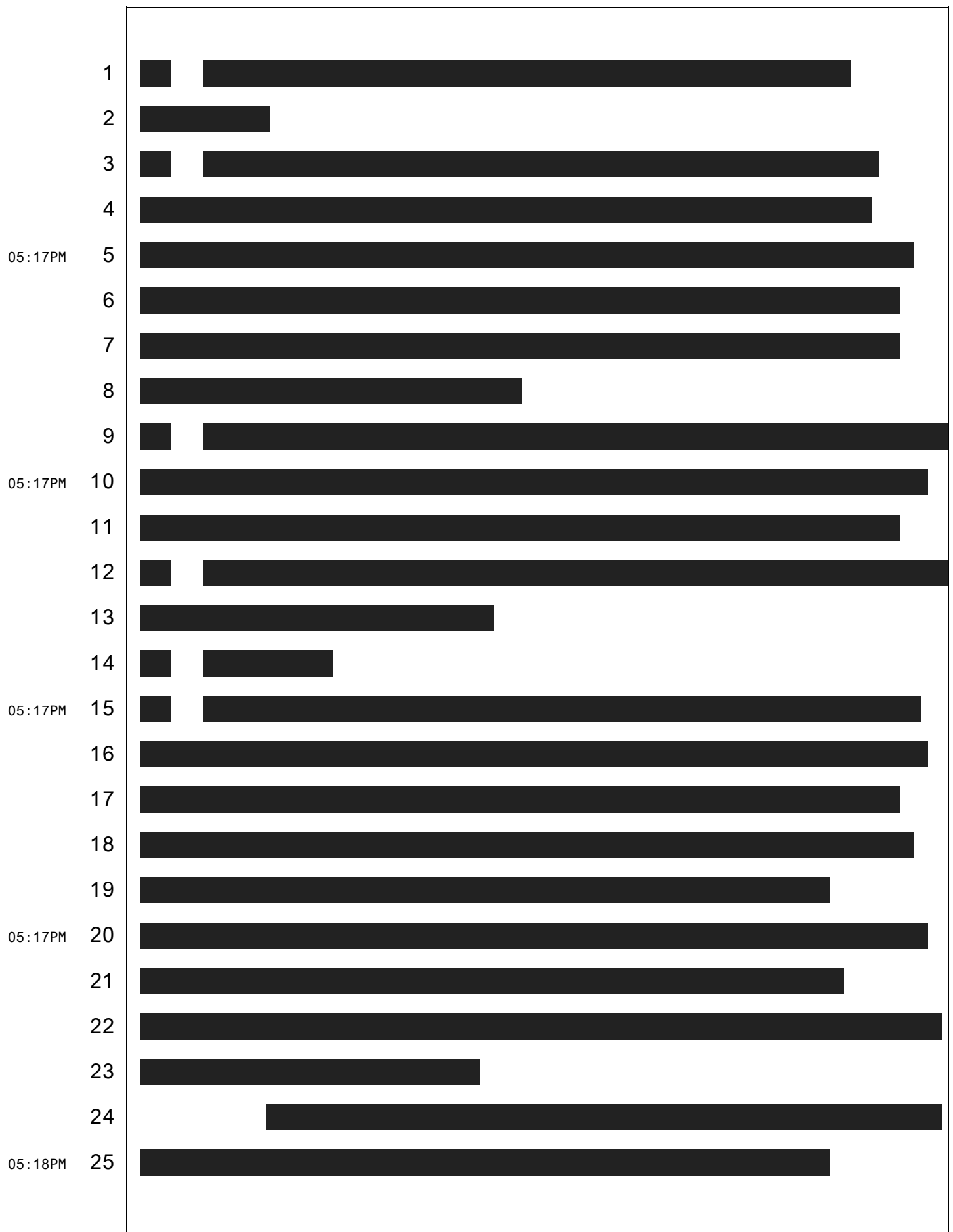


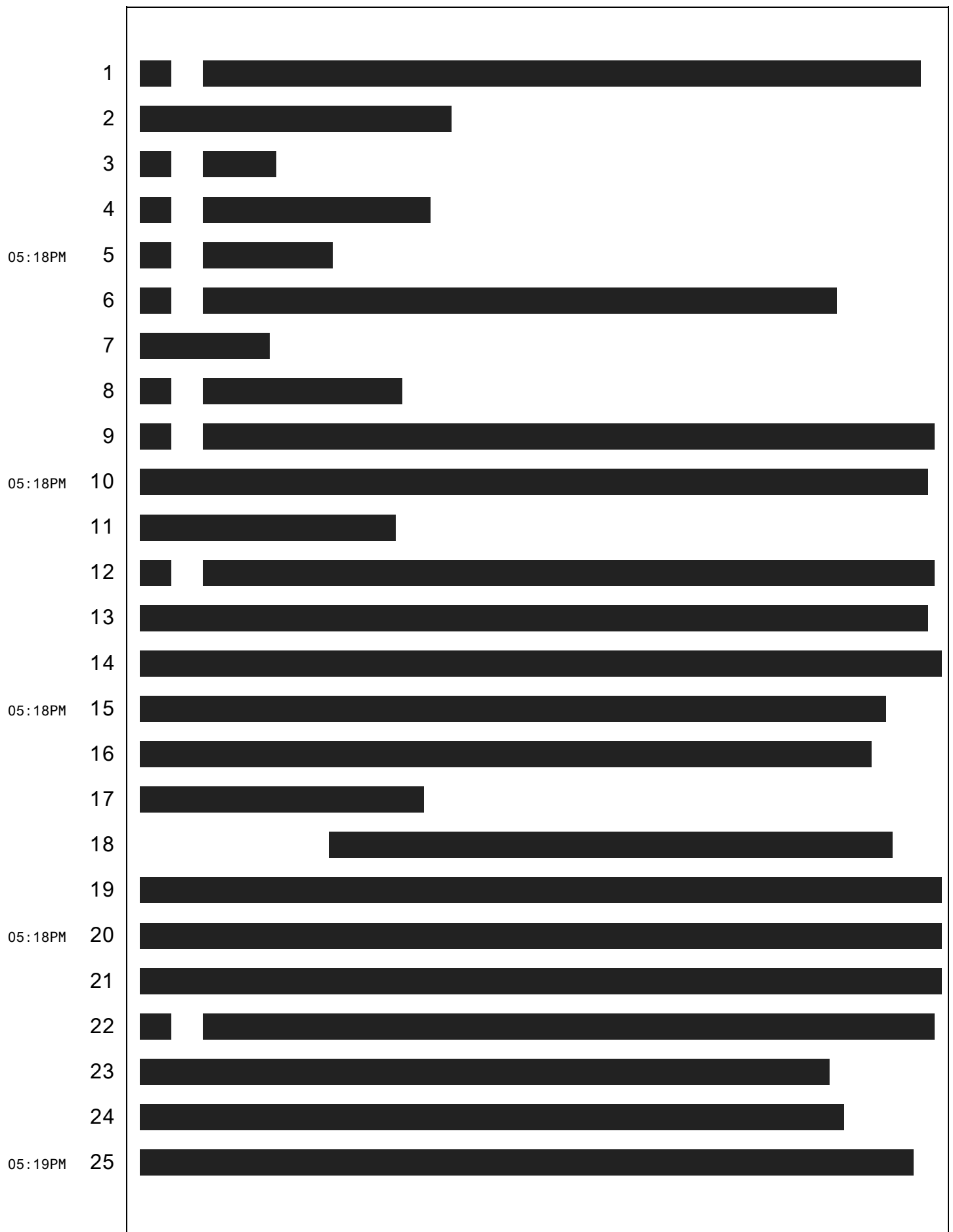


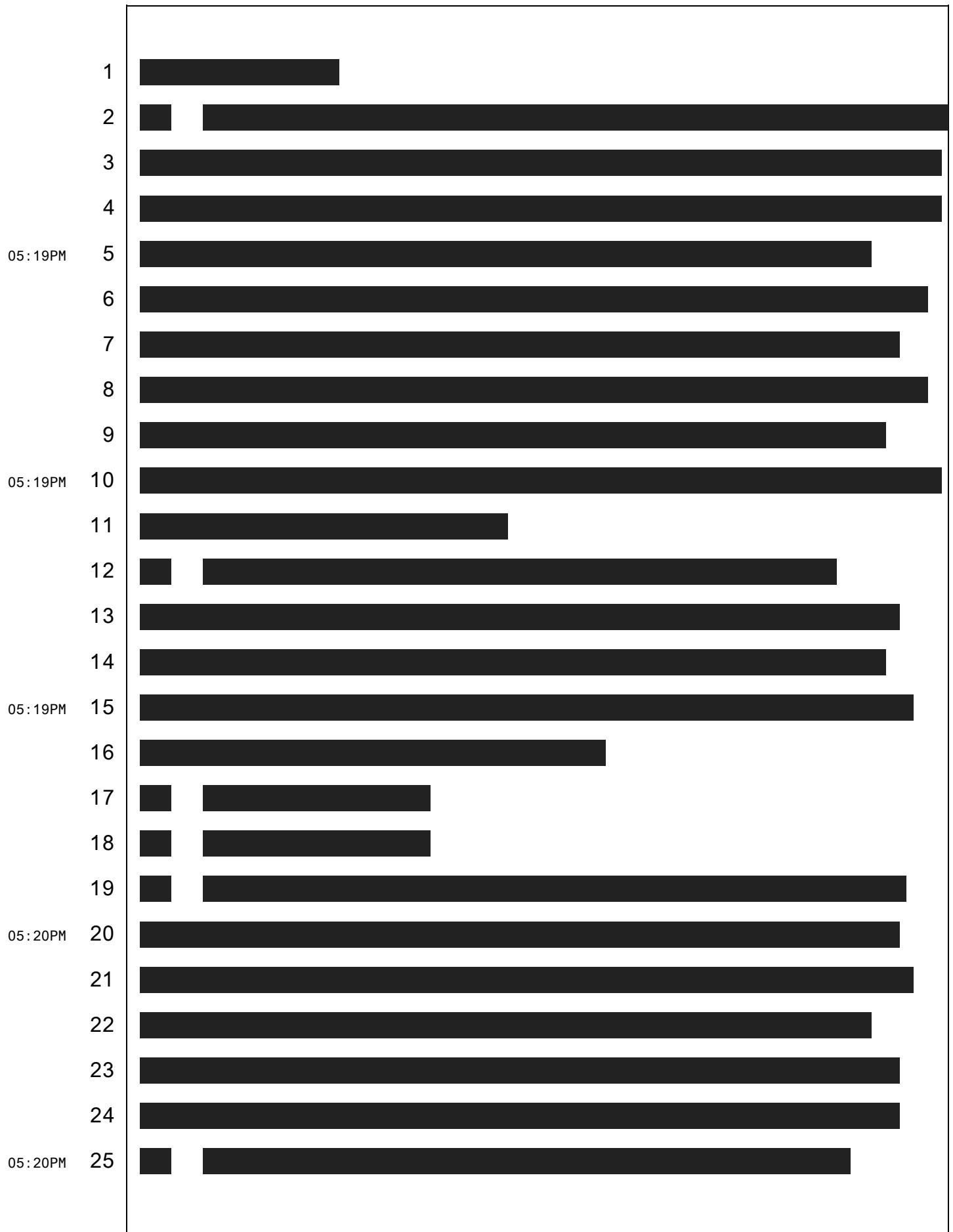




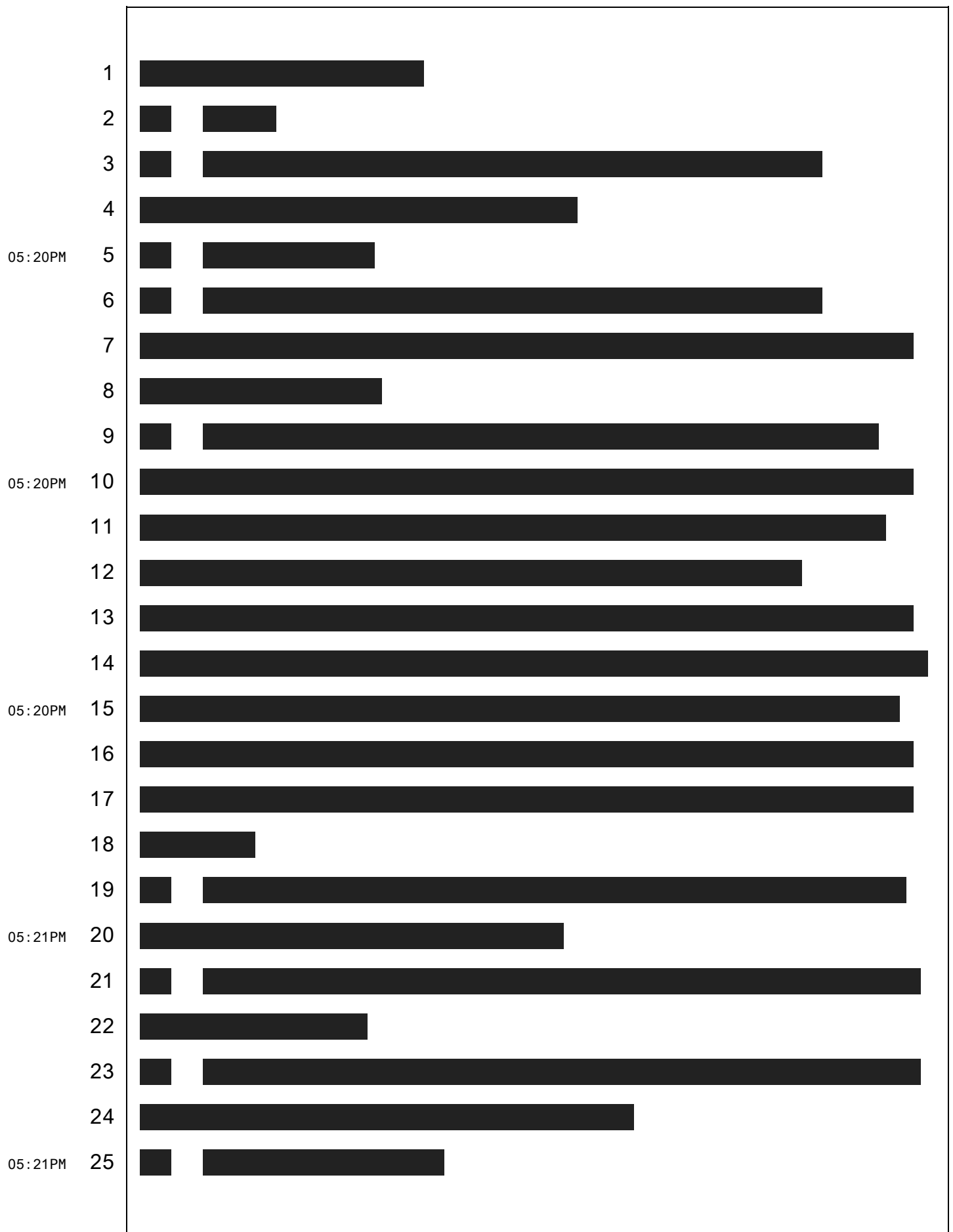












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05:21PM 5 [REDACTED]  
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7 [REDACTED]  
8 [REDACTED]  
9 [REDACTED]  
05:21PM 10 [REDACTED]  
11 (Proceedings now unsealed.)  
12 THE COURT: All right, Mr. Dixon. We're  
13 unsealed. You may continue.  
14 MR. DIXON: Thank you, your Honor.  
05:21PM 15 Q. Mr. Dell, did you find any real-world licenses  
16 outside of the settlement context that would have been  
17 comparable to the hypothetical negotiation license?  
18 A. Yes, I did. As part of my analysis, my independent  
19 research, I did find several agreements related to  
05:22PM 20 semiconductor technologies generally.  
21 Q. How many did you find?  
22 A. My recollection is somewhere, 15 agreements, 16  
23 agreements.  
24 Q. And did you identify any that were helpful and that  
05:22PM 25 you relied upon in connection with your analysis?

1 A. I did. There were four agreements specifically that  
2 were technologically comparable to the Acorn technology.

3 Q. And are those four real-world licenses the ones we  
4 see here on the screen on Slide 34?

05:22PM 5 A. Yes, they are.

6 Q. And can you please identify those licenses?

7 A. Yes. PTX-171 and 182 is a May 1999 and July 2003  
8 agreement between Chartered Semiconductor and Motorola.

9 PTX-179 is a July 1999 IBIS  
05:23PM 10 technology/Mitsubishi Materials license agreement.

11 PTX-180, 176, and 2473 is a December 2000  
12 license agreement between IBIS technology and IBM.

13 And PTX-1179 is a December 2006 patent license  
14 agreement between ASM International and Atomera, but  
05:23PM 15 also R.J. Mears, which is a predecessor company to  
16 Atomera.

17 Q. Mr. Dell, is it common for a damages expert, such as  
18 yourself, to rely upon these real-world license  
19 agreements in determining the appropriate amount of  
05:23PM 20 damages even if these real-world license agreements  
21 don't involve the parties to litigation?

22 A. Yes, it is. In fact, Georgia-Pacific Factor 12, one  
23 of the licensing factors, specifically talks about  
24 royalty rates in the industry for analogous  
05:23PM 25 technologies, or comparable technologies.

1 Q. So after identifying these four agreements, what did  
2 you do next?

05:24PM

3 A. Well, as I mentioned, I bugged Dr. Piner quite a  
4 bit, and I asked him to review the technologies in these  
5 agreements to determine if they are also technologically  
6 comparable to Acorn's patents.

7 Q. And did Dr. Piner, was he able to determine whether  
8 they were technically comparable?

9 A. Yes, he was.

05:24PM

10 Q. And what did he tell you?

11 A. Well, generally speaking, he indicated that with  
12 these agreements specifically, they all relate, in one  
13 way or another, to the formation of oxide layers on a  
14 semiconductor.

05:24PM

15 Q. And, Mr. Dell, on Slide 34 here, you refer to  
16 patents for each of these agreements. Was there other  
17 technology, in addition to patents, that were -- that  
18 was licensed as part of these agreements?

19 A. In some of them, yes, but not all of them.

05:24PM

20 Q. And does that mean you were unable to rely upon them  
21 or that they are not useful in calculating a reasonable  
22 royalty?

23 A. No, not at all. It's something I took into account  
24 and it was a consideration; and as part of the analysis,  
05:25PM 25 you can account for that and adjust for that.

1 Q. And these four agreements, was any one of them  
2 especially helpful in determining the appropriate  
3 royalty in this case?

05:25PM

4 A. There was. The ASM/Atomera agreement was an  
5 agreement of particular relevance given its  
6 comparability to the Acorn patents.

7 Q. And do we see some excerpts from that agreement here  
8 on the screen?

9 A. Yes, we do.

05:25PM

10 Q. Is that PTX-1179?

11 A. Yes, sir.

12 Q. So what was it about this agreement that made it  
13 particularly helpful?

05:25PM

14 A. Well, as a start, there was only two patents  
15 licensed, so a small number of patents; and based on my  
16 understanding from Dr. Piner, the patents themselves  
17 related to in-situ growth of oxide layer and silicon  
18 layers in semiconductor devices, or on semiconductor  
19 wafers particularly.

05:25PM

20 Q. And when was this agreement executed?

21 A. In December of 2006.

22 Q. Do you know if it ever expired?

23 A. It did. It expired in January of 2019.

05:26PM

24 Q. So would this agreement have been known or  
25 potentially known to the parties during the hypothetical

1 negotiation in this case?

05:26PM

2 A. Yes, it would have. It's publicly available, which  
3 is how I was able to find it, but also it was active and  
4 the parties were operating under this agreement at the  
5 time of the hypothetical negotiation in January 2015.

6 Q. Now, I see in the top right corner, we have the  
7 name, "Atomera," but in the agreement, we've highlighted  
8 the name, "Mears." Are those two different parties?

05:26PM

9 A. They were not. They were -- Atomera was originally  
10 known as R.J. Mears, LLC, which ultimately became  
11 Mears Technologies. So it was a name-change, as I  
12 understand it, from looking through the documents.

05:27PM

13 Q. So what, to your understanding, Mr. Dell, did  
14 R.J. Mears or Atomera agree to pay royalties on revenue  
15 from wafer sales under this agreement?

16 A. Yes, they did.

17 Q. And how did you come to that conclusion?

05:27PM

18 A. Well, I reviewed the agreement and followed the  
19 terms of the agreement; and they explicitly provide an  
20 indication of how the parties agree to those terms.

21 Q. Can you walk us through those terms that helped you  
22 reach the determination that wafers were one of the  
23 licensed products under this agreement?

05:27PM

24 A. Sure. We can start at the bottom, which is the  
25 license grant; and as you can see, ASM granted

1 R.J. Mears, or Atomera, a nonexclusive license under the  
2 license claims or under the patents to develop, make,  
3 have made, use, sell, offer to sell, lease, or import  
4 licensed products.

05:27PM

5 And then if we look above where "Licensed  
6 product" is defined, it talks about the products  
7 comprising of permitted structures, which is again also  
8 defined.

05:27PM

9 And so going to the next term, we can  
10 see -- although I won't read all the formulaic  
11 information here, but it talks about, in the middle, the  
12 microlayer of atomic oxygen at a specific range between  
13 two high-quality, single crystal silicon wafers for the  
14 purpose of achieving enhanced semiconductor device  
15 performance.

05:28PM

16 So when putting all those terms together, you  
17 can see that the licensed product itself is a  
18 semiconductor wafer.

19 Q. And why is that relevant to your analysis, Mr. Dell?

05:28PM

20 A. Well, one of the relevancies is understanding of  
21 economic comparability. The licensed products in this  
22 license are the same or similar to the licensed products  
23 that would be contemplated at the hypothetical  
24 negotiation between Acorn and Samsung.

05:28PM

25 Q. And what rate did Atomera agree to pay ASM under

1 PTX-1179?

2 A. So under the next slide, you can see, under the  
3 royalty provision, Atomera agreed to pay ASM a royalty  
4 of 2 1/2 percent of net revenues on the sale of wafers  
05:29PM 5 for wafers manufactured on an ASM machine, but they also  
6 agreed to pay a royalty of 5 percent of net revenues on  
7 the sale of wafers, on wafers manufactured on machines  
8 other than ASM machines.

9 Q. Now, there's a reference for both of those  
05:29PM 10 royalties, 2 1/2 percent and 5 percent to net revenues.  
11 What does net revenues include?

12 A. Well, if we go to the next slide, we can see net  
13 revenues is, again, another defined term, but it talks  
14 about, from an accounting perspective, the net revenue  
05:29PM 15 is the sale or other disposition of a licensed product  
16 or the performance of the processes.

17 And so, again, using the terms of the  
18 license itself indicates that the net sales would  
19 include the sale of wafers, as well as other revenues  
05:29PM 20 potentially.

21 Q. Now, you said that there were three other  
22 agreements, industry licenses that you relied upon as  
23 well. Let's go through each of those briefly, Mr. Dell.  
24 We've got the December 2000 agreement between IBIS and  
05:30PM 25 IBM. How was this relevant to your analysis?



1 A. Again, this is another industry agreement for  
2 comparable technology, and it relates specifically to,  
3 again, my understanding from Dr. Piner, implanting  
4 oxygen on silicon wafers. And, in fact, the licensed  
5 product itself is a silicon wafer.

6 Additionally, as shown in the agreement,  
7 IB- -- excuse me, IBIS agreed to pay IBM a royalty of  
8 4.75 percent on the net revenue for each licensed  
9 product, which is a wafer. So, again, from an economic  
10 comparability and a licensing structure in the industry  
11 in the real world, this is how parties would negotiate  
12 these types of agreements.

13 Q. Now, I see a reference in Section 5.1 on the slide  
14 here to a technology transfer fee of \$500,000. What is  
15 that, Mr. Dell?

16 A. Well, that actually was a payment that was made.  
17 There was some additional technology that was  
18 transferred as part of this agreement. I believe it may  
19 have been some recipes; they are actually defined in the  
20 agreement itself. And as part of that, they agreed to  
21 pay compensation specifically for that other technology  
22 transfer fee.

23 Q. And because this agreement involved a technology  
24 transfer fee or other technologies, does that mean that  
25 a damages expert, such as yourself, can't use this in a

1 hypothetical negotiation framework?

2 A. No, not at all. And, again, the rate in this  
3 agreement is also consistent with the other agreements  
4 that I've seen, as well, so you can see that the rates  
05:31PM 5 are similar.

6 Q. Let's look briefly at those other two. We've got  
7 the IBIS/Mitsubishi from July 1999. Tell us about this  
8 agreement, Mr. Dell.

9 A. So, again, this is another agreement that involves  
05:31PM 10 IBIS Technology Corporation. They are actually  
11 licensing patents to Mitsubishi Materials, and there's  
12 actually a single patent that was licensed as part of  
13 this agreement. My understanding, again, from Dr. Piner  
14 is this relates to the formation of oxide, or oxygen, on  
05:32PM 15 semiconductor wafers; and as part of that, they agreed  
16 to pay an initial royalty fee of \$700,000 but also an  
17 ongoing royalty rate, running royalty of 2 1/2 percent,  
18 2.5 percent on net sales of SIMOX wafers; so, again, a  
19 running royalty based upon revenue attributed to wafer  
05:32PM 20 sales.

21 Q. And the last one is a Chartered  
22 Semiconductor/Motorola agreement. How did you make use  
23 of this, Mr. Dell?

24 A. So similar to the other agreements I reviewed, this  
05:32PM 25 is a July -- excuse me. This is actually a 1999

1 agreement, as well as a follow-on agreement in 2003  
2 where Chartered and Motorola had licensed each other's  
3 technology; and as part of that, they agreed to pay a  
4 royalty of 2 percent to 3 percent on wafer revenue for  
05:33PM 5 the term of the license, as well as other considerations  
6 paid for other technology transfer that occurred.

7 Q. I see that you've highlighted, "Payments equaling  
8 \$41.5 million." Why did you do that?

9 A. Because the agreement itself specifies that the  
05:33PM 10 \$41 million is actually broken out in the agreement, but  
11 that was for rights to some of the other technology  
12 transfer that occurred; so that was monies paid up front  
13 prior to all of the royalty payments that would take  
14 place over the term of the agreement.

05:33PM 15 Q. I believe you testified that as part of your  
16 analysis, you spoke with Mr. Tom Horgan, correct?

17 A. Yes, that's correct.

18 Q. And did you have an opportunity to discuss any of  
19 these industry licenses with Mr. Horgan?

05:33PM 20 A. I did, yes.

21 Q. And what did Mr. Horgan share with you about these  
22 industry licenses?

23 A. Well, one, he was obviously very --

24 MR. CORDELL: Objection, your Honor. Hearsay.

05:33PM 25 THE COURT: What's your response?

1 MR. DIXON: Your Honor, this is the type of  
2 information that an expert would normally rely upon. It  
3 was disclosed in his expert report that this is the  
4 conversation that he had with Mr. Horgan, and he was the  
05:34PM 5 source of this information.

6 THE COURT: Well, I'll allow the witness to  
7 testify as to what he relied on. He's not going to give  
8 verbatim statements or conversation from a third-party  
9 source. He can identify the substance of what he relied  
05:34PM 10 on, if it came from Mr. Horgan or wherever it came from.  
11 He's not going to be a vehicle by which an out-of-court  
12 statement is going to be repeated before the jury.

13 MR. DIXON: Understood. Thank you, your Honor.

14 THE COURT: All right?

05:34PM 15 Q. So, Mr. Dell, what did you take away from your  
16 conversation with Mr. Horgan about these industry  
17 licenses?

18 A. My recollection was that he was familiar with the  
19 companies that were involved in these licenses. In  
05:35PM 20 fact, he testified a moment ago that he was familiar  
21 with Atomera. In fact, an Acorn employee is now  
22 employed at Atomera, as I understood from his testimony  
23 a moment ago.

24 Q. And did you have an understanding that the form of  
05:35PM 25 these agreements, meaning a running royalty on a wafer,

1 would be a form acceptable to Acorn Technologies?

2 A. Yes. In fact, as Mr. Horgan testified, Acorn has  
3 actually entered into a license agreement with  
4 Sequans Technologies -- or Sequans Communications,  
05:35PM 5 excuse me.

6 Q. And is PTX-90, which is Slide 45, is that a license  
7 agreement with Sequans?

8 A. Yes, it is.

9 Q. Did you rely upon this Sequans agreement to  
05:35PM 10 determine your royalty rate in this case?

11 A. I didn't rely on it to determine my royalty rate,  
12 but it does indicate, particularly with respect to  
13 Georgia-Pacific Factor 4, the licensing policies and  
14 practices of Acorn generally in that it prefers and it  
05:35PM 15 has entered into agreements with a running royalty  
16 structure.

17 Q. Are you aware of any evidence -- and perhaps you  
18 heard it today -- that Samsung would agree to a running  
19 royalty rate in a license such as the hypothetical  
05:36PM 20 license?

21 A. Yes. I believe we just heard Mr. Lee's testimony in  
22 that regard.

23 Q. And is that the testimony that we see here on  
24 Slide 46?

05:36PM 25 A. Yes, it is.

1 Q. And Slide 47?

2 A. Yes, that's correct. He testified that Samsung has  
3 entered into running royalty agreements previously and  
4 that there's no policy that they would not enter into a  
05:36PM 5 running royalty agreement.

6 Q. And did you see any industry policies or guidelines  
7 indicating that a running royalty was an appropriate  
8 form of a royalty for the hypothetical license?

9 A. Yes, I did. In fact, there's a well-known and  
05:36PM 10 established policy in the semiconductor industry from  
11 IBM in which IBM licensed its patents at a royalty rate  
12 of 1 percent per patent, not to exceed 5 percent of the  
13 selling price of the licensed product.

14 Q. Now, after analyzing all these, all these  
05:37PM 15 agreements, Mr. Dell, does this slide summarize your  
16 conclusions?

17 A. It summarizes my conclusions of all the licensing  
18 factors and the evidence that would inform the parties  
19 of the hypothetical negotiation and how they would  
05:37PM 20 negotiate.

21 Q. And what was your conclusion after analyzing the  
22 Georgia-Pacific licensing factors?

23 A. So based upon my analysis of the Georgia-Pacific  
24 licensing factors, it is my -- I determined that Acorn  
05:37PM 25 would enter the negotiation at a royalty rate of

1 5 percent and Samsung would enter the negotiation at a  
2 royalty rate of 2 percent based upon the relevant  
3 comparable licenses that I reviewed as part of my  
4 analysis.

05:37PM

5 Q. So now that we have this range of values for the  
6 licensing of comparable technology, what did you do  
7 next? Did you look at the economic factors?

8 A. That's correct. The next step would be looking at  
9 that bucket of factors.

05:37PM

10 Q. And which Georgia-Pacific factors are the economic  
11 factors?

12 A. Generally speaking, the Factor 8, Factor 11, and  
13 Georgia-Pacific Factor 13 relate to the Georgia-Pacific  
14 factors.

05:38PM

15 Q. Let's start with Georgia-Pacific Factors 8 and 11.  
16 What did you learn with respect to the commercial  
17 success and the popularity of the products made that was  
18 relevant to your analysis?

05:38PM

19 A. Well, this is what we talked about a little bit  
20 earlier, which is Samsung, the Acorn patents benefit not  
21 only the chips but the devices that they go into, and so  
22 with faster performance and lower battery use,  
23 et cetera; and so based upon that, the parties would  
24 recognize that there's been significant commercial

05:38PM

25 success not only in the sales of wafers but also in the

1 sales of the chips that go into the devices, and that  
2 would be a factor that the parties would acknowledge and  
3 understand in the negotiation.

05:38PM

4 Q. And what evidence did you see of the commercial  
5 success?

6 A. Well, the sales data, for one; but there was also  
7 other evidence, in terms of Samsung's financial or its  
8 public statements in press releases related to its  
9 financial performance.

05:39PM

10 Q. And is this one of the examples that we see here on  
11 Slide 52?

12 A. Yes, it is. This is an earnings release from the  
13 first quarter of 2015, which would be right around the  
14 time of the hypothetical negotiation in January of 2015;

05:39PM

15 and as part of that, the -- Samsung was acknowledging  
16 that it expected earnings to improve as 14-nanometer  
17 supply would increase and that it would be driven by the  
18 expansion of 14-nanometer FinFET sales so that the  
19 products at issue in this case would actually be helping

05:39PM

20 Samsung's earnings.

21 Q. Now, these -- this slide refers to expectations.  
22 Did you see any future earnings releases or earnings  
23 release statements down the road that indicated whether  
24 these expectations came to fruition?

05:39PM

25 A. Yes, I did.



1 Q. Is this an example here on Slide 53?

2 A. Yes, sir, it is. This is a similar press release  
3 but from the second quarter of 2016, so about a year and  
4 a half later. And, again, the same types of information  
05:40PM 5 were trumpeted by Samsung with respect to its earnings  
6 improvement by stronger demand for 14-nanometer and  
7 premium smartphones, and it would maintain stable  
8 revenues by solid demand for 14-nanometer products and  
9 that it expected that demand for 14-nanometer to  
05:40PM 10 increase.

11 Q. So let's turn now to Georgia-Pacific Factor 13. Are  
12 the relevant considerations identified here on Slide 54?

13 A. They are, yes.

14 Q. And how did you take these into account?

05:40PM 15 A. Well, Georgia-Pacific Factor 13 looks at the portion  
16 of the profit that would be analyzed as part of the  
17 determination of the royalty. The first step of that,  
18 as I talked about a moment ago, is apportionment -- the  
19 principle of apportionment. So we're looking only at  
05:40PM 20 the value of a wafer as a starting point.

21 The second part would be looking at the royalty  
22 rates that have informed the negotiation are already  
23 apportioned because their rates apply to the wafer  
24 values isolated to comparable technology.

05:41PM 25 So the first step in the analysis, that's where

1 Georgia-Pacific Factor 13 starts.

2 And then secondly, you then look at what  
3 Samsung would bring to the table. So you give credit  
4 for Samsung's contributions. Samsung has other  
05:41PM 5 downstream technologies such as packaging, what I  
6 understand to be called end-of-line in semiconductor  
7 manufacturing. They have spent billions of dollars  
8 developing fabrication facilities. All of those factors  
9 would weigh heavily in Samsung's favor in the

05:41PM 10 negotiation and how they would ultimately negotiate.

11 Q. So, Mr. Dell, after considering the technical  
12 benefits, the licensing factors, the economic factors,  
13 what did you determine was the appropriate royalty rate  
14 that the parties would have agreed to in the course of a  
05:41PM 15 hypothetical negotiation?

16 A. So based upon my analysis of all the factors,  
17 ultimately, with respect to Factor 13, from that  
18 2-to-5 percent negotiation range, Samsung and Acorn  
19 would have ultimately agreed to a royalty rate of 3.5  
05:42PM 20 percent to be applied to the value of the wafers that  
21 are incorporating Acorn's technology.

22 Q. And how did you determine that this 3.5 percent was  
23 the appropriate royalty rate?

24 A. Well, as I mentioned, the starting point of a  
05:42PM 25 5 percent royalty based on a comparable license, as well

1 as giving Samsung credit, in fact, significant credit  
2 for its contributions would drive the royalty, from that  
3 5 percent starting rate, down; and as a result, the  
4 parties would also acknowledge the counterbalancing  
5 factor of the downstream sales of products and the  
6 upwards that would be negotiated between the parties.

05:42PM

7 Q. So after reviewing everything and completing your  
8 analysis, sir, what did you determine -- can you remind  
9 the ladies and gentlemen of the jury what you determined  
10 to be the appropriate amount of reasonable royalty  
11 damages that Samsung would owe to Acorn for Samsung's  
12 infringement of Acorn's patented technology?

05:43PM

13 A. Yes, at this point we can now fill in the royalty  
14 formula. So we take the 3.5 percent royalty rate and we  
15 apply that to the \$9.3 billion in accused wafer revenue,  
16 and multiplying those two together results in reasonable  
17 royalty damages of \$326,253,243.

05:43PM

18 Q. And I see that we have the patent damages statute  
19 back up, but this time, you highlighted the phrase, "But  
20 in no event less than a reasonable royalty." Why did  
21 you do that?

05:43PM

22 A. Well, I think we heard this at the very beginning of  
23 the trial that a reasonable royalty is the damages  
24 adequate to compensate and are no less than a reasonable  
25 royalty. So a royalty is the floor to which damages do

05:43PM

1 not fall below.

2 Q. And that \$326.2 million, is that for all the  
3 asserted patents?

4 A. Yes, it is.

05:44PM 5 Q. And is that your opinion, even if only one of the  
6 patents is found infringed?

7 A. Yes, it is.

8 Q. And why is that?

9 A. Well, because as you'll hear, I believe tomorrow  
05:44PM 10 from Dr. Piner, all of the patents themselves are, in  
11 fact, related and have a similar scope or specification  
12 and, therefore, either individually or collectively  
13 would provide the same benefit to the accused products.

14 Q. And is that \$326.2 million a one-time lump sum  
05:44PM 15 royalty?

16 A. No, it is not. It is actually a calculation based  
17 upon the extent of use of Samsung for the relevant  
18 period.

19 Q. And is that what we see here on this slide?

05:44PM 20 A. Yes, it is.

21 Q. And so would the form of the royalty be a running  
22 royalty or a lump sum?

23 A. It would be a running royalty.

24 Q. Why is that?

05:44PM 25 A. Well, because the Acorn patents do not expire until

1 2023, I believe, and so there would be royalties that  
2 would be continued to be after, to the extent that they  
3 are determined to be infringing, that they would be paid  
4 after March of 2021, which is the most recent period we  
05:45PM 5 have data for.

6 Q. Thank you, Mr. Dell.

7 MR. DIXON: Your Honor, I pass the witness.

8 THE COURT: All right. Ladies and gentlemen,  
9 before we proceed with cross-examination, we're going to  
05:45PM 10 recess for the day. This is going to be a fairly  
11 lengthy cross-examination and there will probably be  
12 redirect, and I'm not about to keep you up here until  
13 7:00 or so, which is probably what it would take to get  
14 this witness off the stand today.

05:45PM 15 As you leave the courtroom in a few minutes, be  
16 sure you take your notebooks with you. Leave them  
17 closed on the table in the jury room. Please follow all  
18 the instructions I've given you about your conduct,  
19 including, of course, you would expect me to remind you  
05:45PM 20 not to discuss the case with anyone.

21 Please plan your travel tomorrow so that you  
22 can be at the courthouse and assembled in the jury room  
23 and ready to go by 8:30. We will do our best to start  
24 at 8:30 tomorrow morning.

05:45PM 25 Travel safely to your homes. Have a good

1 evening, and until tomorrow morning, you are excused.

2 (Whereupon, the jurors leave the courtroom.)

3 THE COURT: All right. Please be seated.

4 Counsel, we used a total of 4 hours and 56

05:46PM

5 minutes of trial time today. Of that, Plaintiff has  
6 used 3 hours and 32 minutes and Defendants used an hour  
7 and 24 minutes.

8 We'll begin with Defendants' cross-examination  
9 of Mr. Dell in the morning.

05:47PM

10 Mr. Horgan, this is not a big deal, but I would  
11 prefer corporate counsel [sic] sit at the counsel table  
12 throughout the trial. If you'll make sure you're at  
13 counsel table tomorrow and stay there during the  
14 remainder of the trial, please, sir.

05:47PM

15 Are there any issues that either side needs to  
16 raise with the Court before we recess for the day?

17 MR. McKEON: Your Honor, may I raise one issue  
18 regarding a MIL?

19 THE COURT: That's why I asked, Mr. McKeon.

05:47PM

20 MR. McKEON: Thank you, your Honor. We had a  
21 MIL, your Honor. You may know, the MIL -- Samsung MIL 8  
22 related to total sales. And as you heard from the  
23 witness, they have a 9.3 billion wafer sale theory in  
24 this case. And the MIL does permit Acorn to get into  
05:47PM 25 convoyed sales beyond that, and they went into testimony

1 on slide -- one of their slides, Slide 20, where they  
2 showed revenue from downstream devices up to  
3 \$32 billion, and there was no testimony of that being  
4 convoyed sales or anything of that nature. I am very  
05:48PM 5 concerned that that is a violation of your Honor's MIL.

6 THE COURT: All right. Do you have a response  
7 to that, Mr. Dixon?

8 MR. DIXON: I do, your Honor. The disclosure  
9 of the chip revenue, as well as the revenue from the  
05:48PM 10 accused products is relevant under Georgia-Pacific  
11 Factors 6, as well as 8 and 11, and part of the convoyed  
12 sales. We disclosed these two exhibits, these two  
13 slides, to Samsung. They initially objected to them,  
14 your Honor, and then dropped the objections; and,  
05:48PM 15 therefore, they were on notice. They were clearly aware  
16 of them because they initially said, "We disagree with  
17 them." We said, "What's your basis?"

18 And by the time we pressed them, they  
19 dropped it; and, therefore, we felt that they were  
05:48PM 20 appropriate. Not only were they relevant to  
21 Georgia-Pacific Factors 6, 8 and 11 and part of the  
22 convoyed sales, Samsung was on notice and dropped any  
23 objections.

24 THE COURT: Well, the Court's limiting order  
05:49PM 25 did permit exploration into the area of convoyed sales.

1 As I recall, the primary thrust of Defendants'  
2 MIL Number 8 was to preclude exploration into Samsung's  
3 overall wealth and financial position, which I don't  
4 necessarily believe that there's been a violation of.

05:49PM 5 Tell me how you think the MIL has been violated,  
6 Mr. McKeon.

7 MR. McKEON: Your Honor, they didn't violate  
8 the MIL in that regard, and we do, of course, appreciate  
9 that. But the fact that they never linked the  
05:49PM 10 downstream sales to any convoy issue, there's no  
11 testimony regarding that at all from a witness. So as  
12 it stands now, this is revenue that has nothing to do  
13 with the theory of their case that they put in front of  
14 the jury. It was a big number in front of the jury, and  
05:49PM 15 I'm concerned by that.

16 THE COURT: Well, I certainly have no problem  
17 with you testing that testimony on cross-examination;  
18 and if it is, in fact, convoyed sales, it's one thing.  
19 If it can't be linked to convoyed sales, that's another.

05:50PM 20 I think the door's open to a vigorous  
21 cross-examination of it, but I don't know that I'm  
22 persuaded there's an actual violation of an order in  
23 limine here.

24 MR. McKEON: Thank you, your Honor. Appreciate  
05:50PM 25 it.



1 THE COURT: Okay. Anything further, Counsel?

2 MR. DIXON: Nothing from Acorn, your Honor.

3 MR. CORDELL: Nothing from Samsung, your Honor.

4 Thank you.

05:50PM

5 THE COURT: Let me remind and urge both sides  
6 to vigorously meet and confer overnight. We have quite  
7 a lengthy list of overnight objections to wade through  
8 today that we were able to get through, but I would  
9 certainly enjoy my morning a lot more tomorrow if there

05:50PM

10 were fewer of those that we have to take up. So I'm  
11 going to ask that both sides redouble their efforts to  
12 work through those kind of issues; however, I will be in  
13 chambers by 7:30. We'll follow the same procedure  
14 regarding reporting overnight disputes and dealing with  
15 any unresolved disputes before I bring the jury in  
16 tomorrow.

05:51PM

17 I've told them we're going to start at 8:30, so  
18 we're going to find a way to start at 8:30 in the  
19 morning.

05:51PM

20 Anything else before we recess for the evening?

21 MR. DIXON: Nothing from Acorn, your Honor.

22 MR. CORDELL: No, your Honor. Thank you.

23 THE COURT: All right. We stand in recess  
24 until tomorrow morning.

25 (Proceedings concluded for the day at 5:51 p.m.)

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CERTIFICATE OF OFFICIAL REPORTER

I, Dana Hayden, Deputy Official Realtime Court Reporter, in and for the United States District Court for the Eastern District of Texas, do hereby certify that pursuant to Section 753, Title 28, United States Code that the foregoing is a true and correct transcript of the stenographically reported proceedings held in the above-entitled matter and that the transcript page format is in conformance with the regulations of the Judicial Conference of the United States.

Dated this 13th of May, 2021.



Dana Hayden, CCR, RMR, CRR, CRC  
Federal Official Court Reporter